amateur radio

Vol. 35, No. 11
NOVEMBER
1967

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12A9	12 in.	30-13,000	20 watts	$18.75
Coaxial Type with "Free Edge" bass cone and horn tweeter				
8CX50	8 in.	30-22,000	15 watts	$23.75
10CX50	10 in.	25-22,000	20 watts	$36.00
12TX50	12 in.	18-22,000	25 watts	$62.50
Single Cone "Free Edge" type:				
5A50	5 in.	50-15,000	8 watts	$15.00
Professional Series:				
H50 Horn Tweet.		2,000-20,000	15 watts	$11.10
6M50	6½" Sp'ker	200-6,000	25 watts	$21.00
8L50	8 in. Woofer	37-4,000	15 watts	$28.25
10L50	10 in. Woofer	25-3,000	20 watts	$41.00
12L50	12 in. Woofer	17-2,500	30 watts	$64.00

Please Note.—A7 and A8 types are available in either 8 or 16 ohm Voice Coil. A50, CX50, TX50 and Proessional types, 16 ohms only.

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"AMATEUR RADIO"

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA FOUNDED 1910

NOVEMBER 1967
Vol. 35, No. 11

Publishers:
VICTORIAN DIVISION W.I.A.
Reg. Office: 478 Victoria Parade, East Melbourne, Vic., 3002.

Printers:
"RICHMOND CHRONICLE," Phone 42-2419.
Shakespeare Street, Richmond, Vic., 3121.

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All matters pertaining to "A.R.," other than subscriptions, should be addressed to:

THE EDITOR,
"AMATEUR RADIO,"
P.O. BOX 36,
EAST MELBOURNE, VIC., 3002.

Acknowledgments will be sent following the Committee meeting on the second Monday of each month. All Sub-Editors should forward their articles to reach "A.R." before the 5th of each month. Any item received after the Committee meeting will be held over until the next month. Publication of any item is dependent upon space availability, but in general about two months may elapse before a technical article is published after consideration by the Publications Committee.

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Members of the W.I.A. should refer all enquiries regarding delivery of "A.R." direct to their Divisional Secretary and not to "A.R." direct. Non-members of the W.I.A. should write to the Victorian Division, C/o. P.O. Box 36, East Melbourne. Two months' notice is required before a change of mailing address can be effected. Readers should note that any change in the address of their transmitting station must, by P.M.G. regulation, be notified to the P.M.G. in the State of residence; in addition, "A.R." should also be notified. A convenient form is provided in the "Call Book".

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Direct subscription rate is $3.00 a year, post paid, in advance. Issued monthly on first of the month. February edition excepted.

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W.I.A. OFFICIAL BROADCASTS

NEW SOUTH WALES

VK2WI, Sundays, at 1100 hrs. E.A.S.T.
3595 Kc. a.m. — 145.130 Mc. a.m.
7146 Kc. a.m. — 146.000 Mc. f.m.
53.866 Mc. a.m. — (53.950 Mc. f.m. proposed shortly)

VICTORIA

VK3WI, Sundays, at 1030 hrs E.A.S.T.
1825 Kc. a.m. — 144.500 Mc. a.m.
3600 Kc. s.s.b. — 145.854 Mc. f.m.
7146 Kc. a.m. — 432.500 Mc. a.m.
53.032 Mc. a.m.

QUEENSLAND

VK4WI, Sundays, at 0800 hrs. E.A.S.T.
3580 Kc. — 53.995 Mc.
7146 Kc. — 144.36 Mc.
14.342 Mc.

SOUTH AUSTRALIA

VK5WI, Sundays, at 0900 hrs. C.A.S.T.
3.5, 14, 52 and 144 Mc. bands.

WESTERN AUSTRALIA

VK6WI, Sundays,

TASMANIA

VK7WI, Sundays, at 1000 hrs. E.A.S.T.
3672 Kc., and re-transmitted by representative stations on—
7146 Kc. — 144.1 Mc.
53.032 Mc. — 432.6 Mc.

FEDERAL COMMENT:

FEDERAL COMMUNICATIONS

John Battrick, VK3OR

In response to several requests from Divisions for Federal items for their broadcasts, and also in line with the present Executive's policy of increasing the Federal content of "A.R." we present a new news format this month.

Briefly, in each month's "A.R." three or four short news items on different topics will appear. Each of these will be pre-released by F.E. simultaneously, one a week, to Divisional Federal Councillors who will forward a copy to their Broadcast Committee. Therefore, this material will be firstly on Divisional Broadcasts, and secondly in "A.R." Some of the items will be from that mass of correspondence passing through F.E's hands, which appears as routine to Executive but contains many matters of general interest to members. In particular, we would like to mention at this moment the liaison continually undertaken with hdq. of I.A.R.U., the International Amateur Radio Union.

The Federal Secretary of the W.I.A. has been corresponding actively with I.A.R.U. in a desire to clarify points pertinent to the Institute's policy towards Region III. Liaison. Suggestions on the policy to be adopted with regard to South-East Asia and I.A.R.U. will be passed along to Divisions in the near future. Liaison with R.S.G.B. and A.R.R.L. as representing Regions I. and II. has been undertaken, and covers such matters as reciprocal licensing, methods used by Intruder Watch systems in those Regions, right down the line to comments and methods used overseas to control car ignition suppression.

Recently in the Australian press, comment has been passed relating to a possible change in the structure of the P.M.G's Department, notably to suggest a Statutory Corporation to undertake the business activities of the Post Office. In order that we may be prepared, the Institute has sought comment from A.R.R.L. re the American F.C.C. system, and from R.S.G.B. on contemporary events in the U.K. These comments from overseas are intended to give Executive some background just in case changes are suggested in regard to the regulatory functions at present undertaken by the P.M.G's Department.

From time to time W.I.A. has to vote as an I.A.R.U. member on International matters. Recently an affirmative vote was cast on three proposals to admit new Amateur Societies to I.A.R.U. Notably the Radio Club of Honduras (R.C.H.), the Central Radio Club of Bulgaria (C.R.C.B.) and the Association des Radio Amateurs Ivoiriens (A.R.A.I.)—the National Society of the Ivory Coast. Details of their organisation and licensing requirements are received and studied to give us some guide as to overseas trends in Amateur licensing. It is of interest to note that all three of these countries report a good attitude of their government to Amateur Radio.

Details of the I.A.R.U. Region II. conference at Caracas, Venezuela, earlier this year are to hand, and it may be noted that at the conference it was felt more development should be given to v.h.f. and u.h.f. in Region II., and plans developed for expanded emergency communications networks in that region.

In addition to domestic matters of International Amateur Radio, Executive is kept informed on I.T.U. matters. A World Administration Radio Conference to deal with matters relating to the Maritime Mobile Service is being held in Geneva at the moment (Sept. 18 to Nov. 4). The agenda, like that of other recent specialised conferences is strictly limited to matters concerning the specific service. The meeting will not deal with questions affecting Amateur Radio, and as yet there has been no indication of any plans for a conference to deal with frequency allocations.

So, from time to time these Federal news items will be presented to you indicating the state of liaison both at home and overseas, and the efforts being made to keep in touch. This is also a new effort to keep W.I.A. in touch with its members.

INTRUDER WATCH

Institute policy on Intruder Watch was determined at Hobart last Easter by means of Motion 2.3: "**That in confirmity with I.A.R.U. policy, the Wireless Institute of Australia inaugurate an Intruder Watch Service on an organised basis to be administered by Federal Executive.**" This was moved by Federal Executive, seconded by the Queensland Division, and carried unanimously.

In October "Amateur Radio" on page 24, Max Hull, VK3ZS, the W.I.A. Federal President, outlined in a very comprehensive report the need for an Intruder Watch, and asked for your assistance. Please read it, and if you can offer your assistance as indicated, do so immediately. It is of interest to note that this move was initiated in answer to a request from International Amateur Radio Union headquarters and we quote from I.A.R.U. Calendar of this year on page 5:

"The headquarters again urges Member Societies of the Union to establish some form of Intruder Watch". Section 3, Article 3, of the Radio Regulations, Geneva 1959, states as follows:

"Administrations of the members and associate members of the International Telecommunications Union (I.T.U.) shall not assign to a station any frequency in derogation of either the table of frequency allocations given in this chapter or the other provisions of the Regulations, except on the express condition that harmful interference shall not be caused to services carried on by stations operating in accordance with the provisions of the Convention and of these Regulations."

What this section of I.T.U. Regulations means to us Amateurs is that if a station in the fixed or broadcasting service operates in the Amateur bands, this operation **is permitted** under the terms of the I.T.U. Regulations, provided no interference is caused to the Amateur Service; thus it is essential that we Amateurs file complaints of interference whenever it occurs.

In short, it is not just the nuisance caused by an intruder, but the I.T.U. Regulations will permit him to remain there if he does not cause us interference, and unless we inform on this interference, he has every right to be there. Accordingly, as an I.A.R.U. Member Society, the W.I.A. is undertaking action to establish liaison with our Government Departments in connection with the filing of complaints; however, these complaints must be filed in proper and effective and standard manner.

As indicated in Max's article, on page 24 of October "Amateur Radio," the A.R.R.L. and the R.S.G.B. have a specific system of monitoring, recording and reporting. These systems have been communicated to the W.I.A. recently, and they have been examined by the Intruder Watch Committee, which at the moment consists of Federal President, Max Hull, VK3ZS; Assistant Federal Secretary, Peter Williams, VK3IZ; Federal Liaison Officer, George Pither, VK3VX; and Federal Executive member, Dr. David Wardlaw, VK3ADW, who has agreed to become the Federal Operations Officer of the W.I.A. Intruder Watch. David has been an Executive member for some years, and also while living in Canada was a member of A.R.R.L. and while living in Britain was a member of R.S.G.B.; therefore he has first hand knowledge of the systems used overseas and his experience will, no doubt, be valuable in setting up Intruder Watch in Australia.

So keeping in mind the comments made earlier that intruders are not just nuisances, but may become permanently established in the Amateur bands, the W.I.A. is instituting an Intruder Watch Service which, at the present moment, is

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FEDERAL COMMUNICATION No. 4:

THE NEW HANDBOOK

IN the October 1967 issue of "A.R." the background to the revision of the Handbook was given, as was a brief list of changes made. This and subsequent articles will describe some of the more important of these changes in greater detail.

Before doing so, it may well be appropriate to reiterate how the Amateur Service is regulated. In Australia all licences to transmit by radio are currently issued and administered by the Postmaster-General's Department.

The basic legislation making this the responsibility of the Department is the Wireless Telegraphy Act. Because this Act is very broad in its scope, more explicit "rules" are set out in the Wireless Telegraphy Regulations which are the Regulations made under the Act. Not all of these Regulations apply to the Amateur Service, but the effect of those that do is explained in detail in the Handbook which is issued by the Department.

One of the most obvious changes is the re-organisation of the contents. So far as possible, all related provisions are grouped together to keep the need for cross reference to an absolute minimum. As well, the provisions are now set out in a more logical order. It is to be hoped that the intent to make the new Handbook a simpler document to understand has been achieved to a large degree.

Some of the specific changes which have been made are:—

1. SIDEBAND POWER

As indicated in a letter from the Department which was printed in December 1966 issue of "A.R.," the power limit for single sideband suppressed or reduced carrier is now 400 watts peak output.

Until the Department's letter was published, the a.m./c.w. limit of 150 watts d.c. input to the final had applied but just what this meant in terms of sideband was far from clear. How to measure it was even more obscure.

It was agreed that the problem could be solved, and parity achieved if a peak sideband output equal to the usual class C fully modulated a.m. peak output was used as a basis for the power limit. The type, number and class of operation of the output tubes used in the sideband rig would thus not need to be specified and the Amateur would enjoy greater freedom in designing his gear.

Thus the new Handbook states:—

> **"Paragraph 72**—Where an Amateur Station is utilising A3A or A3J emission, the peak envelope power of the radio frequency output, measured at the input to the antenna transmission line, shall not exceed 400 watts . . ."

Note.—A3A is single sideband reduced carrier and A3J is single sideband suppressed carrier.

The method of power measurement to be used with sideband transmitters is substantially that currently prescribed by the British Post Office.

The new Handbook states:—

> **"Paragraph 72**—The determination of power shall be made by the following method:
>
> "Apply two non-harmonically related sinusoidal tones of equal amplitude to the single sideband transmitter which is operating into a resistive dummy load and an appropriate r.f. current meter. With an oscilloscope connected across this load, the transmitter with the carrier fully suppressed is adjusted for maximum power output coinciding with linear operation as indicated visually on the oscilloscope.
>
> "The power output is then calculated by the formula:
>
> $$Pm = I^2 R$$
>
> where Pm = Mean power in watts.
> I = R.f. current ampere flowing in the dummy load.
> R = Resistance of dummy load in ohms.
>
> "The resultant figure, being mean power, is doubled to give peak envelope power. This value must not exceed 400 watts."

2. COMPONENTS

The old Handbook contained a provision that the combination of components used in the power supply and final should not be capable of allowing operation at higher power levels than those permitted. The string of components had to contain a "weak link" as it were to ensure that the power limit could not be exceeded.

This may have been a reasonable provision during the immediate post war period when very high power transmitters could be obtained cheaply from surplus sources, but it was felt that, under the present day conditions, such a provision was no longer necessary; further, in many cases its application was the result of an individual's opinion.

As an analogy it was argued that motor cars are not designed to ensure compliance with speed limits. The onus is on the driver to ensure that he does not misuse his car in such a way as to break the law.

Therefore, the restriction has been deleted from the new Handbook and an Amateur can now use what combination of components he wishes in constructing a transmitter.

One thing must be emphasised. The Amateur remains liable at all times to ensure that his transmitting equipment is operated within the permitted power limits. The deletion of the restriction on certain combinations of components will provide no excuse for exceeding the power limit at any time.

Harold Hepburn, VK3AFQ

3. FREQUENCY MEASURING EQUIPMENT

The old Handbook required that an Amateur should possess frequency measuring equipment of a specified type. For all practical purposes the type originally required was a BC221 or equivalent frequency meter. Since it was by no means clear what constituted an "equivalent" it was felt that the requirement should be withdrawn and replaced by something more comprehensive. The new Handbook now states that:—

> **"Paragraph 54**—The licensee of an Amateur Station shall take all steps necessary to ensure that the emissions from his station are within the limits of the Amateur frequency band on which he is operating. For this purpose he shall have available at his station frequency measuring equipment capable of verifying that emissions are within authorised Amateur bands."

For example, simple band edge crystal calibrators could come within the scope of the above requirement. The individual Amateur is still fully responsible for keeping in the band he is working on and he will have to show that the frequency measuring equipment he elects to use will do this satisfactorily.

So long as the Amateur can ensure that his transmission is within the band, he is no longer required to be able to determine his precise frequency within the band.

4. TYPES OF EMISSION

With the much wider use of modes of transmission, such as f.m., r.t.t.y., etc., it was felt that a greater choice of mode should be available on the different frequency bands. The new table is shown in Table 1.

If Table 1 is compared with the old table and with the individual Amateur's station licence it will be seen that a much wider choice of mode is now allowed.

5. PORTABLE AND MOBILE OPERATION

Under the provisions of the old Handbook licensees were required to apply to the Department when they wished to operate portable for periods in excess of 24 hours on frequencies below 52

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FEDERAL COMMENT (Continued from Page 2)

just getting under way. However, co-operation is needed from Amateurs and Short Wave Listeners, not only in being increasingly vigilant in reporting interference from intruders, but also offering help as requested in the report, page 24, October "Amateur Radio".

Please read it again. Incidentally, those of you who have r.t.t.y. equipment, your services are also extremely valuable as many intruder stations are establishing teletype circuits in the Amateur bands. Once again, the Federal Operations Officer for Intruder Watch is David Wardlaw, VK3ADW, C/o. Box 2611W, G.P.O., Melbourne, 3001, and again, an intruder station may become permanently and legitimately established if the interference he causes is not reported.

THE AUSTRALIS-OSCAR "A" SATELLITE

Last month the organisers of "Project Australis", namely the Melbourne University Astronautical Society, delivered copies of a very well-produced **User's Guide** to co-ordinators in each State. Federal Executive also obtained some of these and a copy has been forwarded to each Division of the W.I.A. through the Federal Councillor.

Recent publicity in the press and on t.v. has raised doubts in the minds of some Amateurs as to the exact status of this satellite. In August "Amateur Radio" of this year, page 3, it is stated in an article that: "The entire operation will be supervised by Project Australis, and not availble to any Amateur". The organiser of the project, Mr. Richard Tonkin, has indicated to Federal Secretary that this comment only refers to the supervision of the command systems, and in fact the success of the entire project depends upon the support of a large number of tracking stations. Therefore Project Australis is anxious to enlist the co-operation of suitably equipped radio operators, short wave listeners and v.h.f. enthusiasts everywhere.

Therefore you, as a member of W.I.A., do have an important part to play after its launch, but you did also play quite an important part in the development of this first Australian Satellite. This part was played through your national amateur society, W.I.A., and the following extracts from official minutes may serve to emphasise this.

Institute policy on this satellite stems from motions of the 1966 Brisbane Federal Convention, notably, Motion 2.5, moved New South Wales Division, and seconded West Australian Division, "**That the possibility of launching an 'Oscar' Satellite or similar experimental device sponsored by the Wireless Institute of Australia be investigated**". Discussion on this motion included comment from VK2 delegate that it had been put with no prior knowledge of the activities of M.U.A.S., and comment from Mr. Tonkin representing M.U.A.S.—who had gone to Brisbane at his own expense. In his explanation, Mr. Tonkin indicated that the co-operation of the "Oscar" Project in U.S.A. had been contacted and that they had promised to provide launch facilities. He also stated that work to date had exhausted their meagre funds and that they were approaching the Institute for sufficient funds to purchase the components for the final flight package. At that stage he estimated that some $400 would be required.

From that discussion there was the following motion arising, motion 2.5.1: "**That the Institute shall support the Melbourne University Astronautical Society 'Australis Project' in the manner following . . .**", then followed eight points relating to joint control and to the contribution and expenditure of funds. At the conclusion of the debate on these motions, Mr. Tonkin thanked the Chairman and delegates for the support, which would enable certain completion of the project.

It would seem then that the W.I.A. and the M.U.A.S. had independently made moves for an Australian Amateur Satellite, and that at Brisbane last year reached mutual agreement for this satellite to be a joint effort. All Divisions contributed funds to the project and Executive, in addition, has paid the air freight of the completed package to U.S.A. So, you all in a small way perhaps, but in a NOT insignificant way, contributed to the amount of finance initially requested by the organisers to complete the project as it was then envisaged. At some time in the near future we hope Oscar Inc. will be able to arrange a ride into orbit, and then your help will be again required to assist the M.U.A.S. in tracking this first Australian Amateur Satellite.

John B. Battrick, Federal Secretary, W.I.A.

THE NEW HANDBOOK

(Continued from Page 3)

Mc. In addition, there was an apparent restriction on the number of times during any year that such permission would be granted.

No limitations were imposed on licensees who wished to operate portable on v.h.f. frequencies.

The exact position of mobile operations in the old Handbook was ambiguous and needed clarification, though in respect of periods of continuous absences from the licensed location the same position applied as in the case of portable operation on the h.f. bands. The effect of these provisions was to exclude limited licensees from ever having to seek the Department's permission to operate portable/mobile.

Frequency Bands	Type of Emission
All Bands	A1, A3, A3A, A3B, A3H, A3J, F1, F3 (±3 Kc.), and for RTTY—F1, F2 or A2.
All Bands above 52 Mc.	A0, A2, F2, F3, P0.
Ultra High and Super High Band	A5, P1, P2D, P2E, P2F, P3D, P3E, P3F.

Table 1.

In the new Handbook it will be found that as far as both portable and mobile operation are concerned licensees may operate on all frequencies for continuous periods of up to five days before permission from the Department is required.

If portable or mobile operation away from home for periods in excess of five days is required, licensees (both full and limited) must apply for permission.

Note that daily mobile operation (for example going to and from work) is a special case. Provided always that the licensee and his transmitter returns each evening to the address on the licence then daily mobile operation without prior Departmental approval is permitted on an indefinite basis, as permission is only required in respect of continuous absence exceeding five days.

The new Handbook paragraph states:

"**Paragraph 90**—An Amateur station licence, as a general rule, authorises the operation of the station at a fixed location. Subject to the written approval of the Superintendent, Radio Branch, however, such stations may be operated in a portable or mobile capacity for specified periods.

"Applications in writing must reach the Superintendent at least three days before such an operation and should indicate—

(a) The period for which the portable/mobile permit is required, and

(b) The area or locations in which it is intended to operate.

"A request by telephone for such a permit will not be accepted other than as an intimation that a written application has been forwarded."

"**Paragraph 91**—Notwithstanding anything contained in the two preceding paragraphs, the licensee of an Amateur Station may operate his station in a portable or mobile capacity without obtaining the approval of the Department for a maximum period of five consecutive days."

Note.—The two preceding paragraphs referred to above are numbers 89 and 90. Number 89 refers to transfer of address and inaccessability of equipment.

—Harold L. Hepburn,
Federal Vice-President, W.I.A.

THE VK3 V.H.F. GROUP 6-METRE CONVERTER

BY THE CONVERTER COMMITTEE, VK3 V.H.F. GROUP

EARLY this year (1967) the VK3 V.h.f. Group formed a committee to investigate and prepare designs for a series of converters for the 52, 144 and 432 Mc. bands and where possible to arrange for the bulk purchase of selected components where this would benefit the members of the Group. At an early meeting of the committee the basic design objectives for the converters were formulated and it was decided to proceed initially with the design and production of the 52 Mc. converter. The basic design objectives were:

(a) The design should be adaptable to a wide range of i.f. output frequencies.

(b) The converters should be readily reproducible and simple to align.

(c) The design should have good cross-modulation and inter-modulation characteristics (mainly on account of Channel 0 which can cause considerable trouble in some parts of Melbourne).

(d) It should have a good performance together with a reasonably low total cost.

DESCRIPTION

It was felt that the use of Field Effect Transistors (FETs) was warranted to give the required cross-modulation characteristics and the 2N3819 junction N-channel FET (Texas Instruments) was selected on account of its low cost and adequate performance. For those of you who have not had much to do with FETs a few brief details may be in order at this stage.

A field effect transistor is very similar in its characteristics to a triode vacuum tube as it is a three-terminal device having a high input impedance and a moderate output impedance. When correctly biased the FET is superior to both vacuum tubes and conventional transistors in their resistance to cross-modulation and as well as this their noise figure is quite comparable.

There are some disadvantages in the use of FETs and one of these is their relatively large spread of their characteristics. For example, the 2N3819 can have a zero bias drain current of between 2 and 20 mA., a cut-off bias for 200 uA. drain current from —0.5 to —7.5 volts, and a transconductance between 2,000 and 6,500 uMho. This means that to obtain optimum performance the operating bias must be individually adjusted for each device. A second problem is the fact that the feedback capacitance is relatively high (similar to a triode vacuum tube) and hence neutralising is often required, especially in the v.h.f. region.

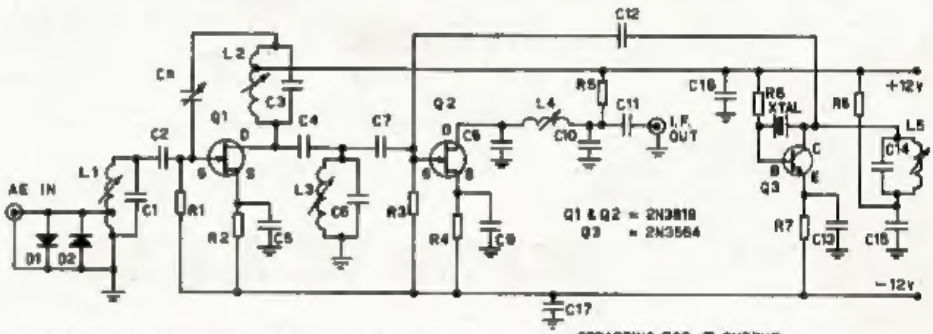
I.F. Output	Xtal Freq.	L4 turns	C14 pF.
14 to 16 Mc.	38 Mc.	35	22
7 „ 9 „	45 Mc.	60	15
4 „ 6 „	48 Mc.	90	15

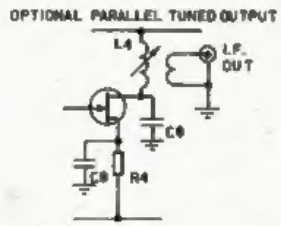
Table 1.

The final design uses one FET as a common source r.f. amplifier with a second FET as a mixer employing gate injection from a crystal controlled oscillator. Between the r.f. and mixer stages is a coupled bandpass pair of tuned circuits to give a reasonable bandwidth. The output is a pi-coupler arrangement to provide a match between the mixer and the co-ax. feed to the main receiver, however provision has been made on the printed circuit board for a parallel tuned, link coupled output arrangement for those who prefer this method.

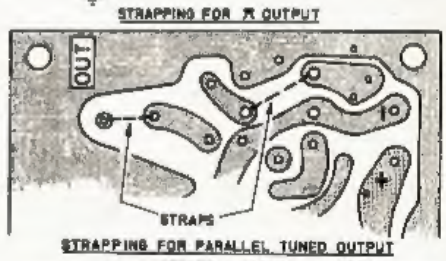
The crystal oscillator employs a conventional silicon transistor and a third overtone crystal, the frequency of which depends on the i.f. output frequency required. For example, an i.f. of 4 to 6 Mc. would require a crystal of 48 Mc., although a crystal on 58 Mc. would give the same output but with reverse tuning.

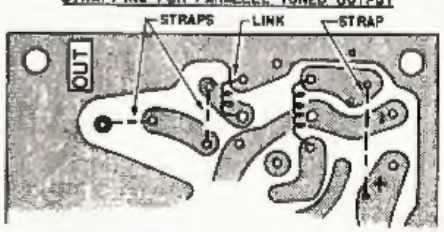
The converter is constructed on an epoxy fibre-glass printed circuit board 4" x 2½", which allows adequate space for the components. A smaller size board could have been used but this would have made assembly more difficult and probably have required the use of special components. The coil





NOTE
1. R5 C11 Replaced by links
2. C10 Not required.
3. C8 L4 Varied as required





R1, R3—100K, ½w.
R2—See text.
R4—10K, ½w.
R5, R8—1K, ½w.
R6—220K, ½w.
R7—1.5K, ½w.
Capacitors (all disc ceramic):
C1—6.8 pF.
C2—100 pF.
C3, C6, C7, C8—15 pF.
C4—4.7 pF.
C5, C11, C13, C15—1000 pF.
C9—0.01 uF. "Redcap"

COMPONENT LIST

C10—56 pF.
C12—1.5 pF.
C14—See Table.
C16, C17—0.1 uF. 25v. "Redcap".
D1, D2—OA95 or similar germanium diodes.
Crystal—Third overtone of required frequency, Style D holder.
Co-ax. Sockets—Belling Lee L604.
Cn (neutralising trimmer)—Philips solder-in screw trimmer, 6 pF. ceramic.
Coil Formers—Neosid Style A (single), and Style B (double) assemblies.

CONVERTER MODIFICATION

It has been found that the bandpass pair of tuned circuits, L2 and L3, in the original circuit were considerably over-coupled, resulting in an excessively wide bandpass. To correct this situation, capacitor C4 is deleted and a ferrite cup-core (Neosid Type T31/500) placed over L3. The bandwidth should now be about 1 Mc. which can be broadened if necessary by stagger tuning.

formers used are the Neosid type A (single assembly) and the type B (double assembly) with aluminium screening cans. The coil formers have a nominal diameter of 0.2" and the coil data given in Table 2 is given for these formers with F16 screw cores in L4 and F29 screw cores for all other coils.

PERFORMANCE

A noise figure of 2.5 db. has been measured on one of the prototypes using a high-quality commercial noise generator and comparative checks with other prototype converters using another uncalibrated noise generator have shown similar results. The i.f. frequency used when the noise figure of 2.5 db. was obtained was 14 Mc. and the receiver used had a noise figure at this frequency of greater than 15 db. Gain measurements have not been made but sufficient gain is available to over-ride the noise in any tuneable i.f. that is likely to be used. A number of converters have been constructed and all have given excellent results with no difficulties in construction or alignment.

L1—12 turns 24 B. & S. close wound, tapped 3 turns from earth end; Neosid A assembly, single, F29 screw core.

L2—10 turns 24 B. & S. close wound, tapped 3½ turns from Cn end.

L3—8 turns 24 B. & S. close wound. Both L1 and L2 using Neosid B assembly, double, F29 screw cores.

L4—See Table 1, scramble wound 30 B. & S., winding length 0.3 inch; Neosid A assembly, F16 screw core.

L5—12 turns 24 B. & S. close wound; Neosid A assembly, F29 screw core.

Table 2.—Coil Details.

No attempt has been made to quote minimum signal levels that can be copied because as well as being influenced by the noise figure of the converter r.f. stage, the i.f. bandpass characteristics of the following receiver play a major part. On 6 metres the major factor is usually band noise (motor car ignition, power line noise and other associated "rubbish").

In the Melbourne area considerable difficulty is often experienced with 6 metre converters using valves and conventional transistors by cross-modulation or inter-modulation caused by the sound carrier from Channel 0 (51.75 Mc.). Even while listening to a signal near band edge with the beam pointed towards the t.v. station no sign of spurious responses has been detected in the prototype converters. No doubt if you were close enough to the t.v. transmitter then some trouble could be expected (although the tuneable i.f. would probably "pack up" before the converter gave trouble), but most normal converters would be useless long before this anyway.

ALIGNMENT

The alignment of the completed converter is quite simple and the first step is to ensure that the crystal oscillator is functioning correctly. A voltmeter is connected across R8 and the screw core in L5 is adjusted for a maximum voltage reading (maximum current through Q3). A resistor of about 10K (a 10K potentiometer is quite suitable) is temporarily connected in place of R2 and the screw cores in L1, L2, L3 and L4 adjusted for maximum response to a signal in the band. It will probably be found that the r.f. amplifier becomes unstable as the gain increases and Cn must be adjusted to restore stability. The adjustment of L1, L2, L3 and Cn all interact slightly with each other and it will take some care to get top performance from the converter.

With Cn set mid-way between the positions where the r.f. amplifier becomes unstable, the value of R2 can be progressively reduced, re-adjusting Cn as needed to keep the r.f. stage stable. The reduction in the value of R2 will cause the gain to increase and at the same time the setting of Cn will become more critical. When the stability tends to become marginal due to the increased gain, a fixed value of resistance can be substituted for R2 and in practice, depending on the characteristics of the particular FET used, the value can vary between 100 ohms and 5K ohms.

It will be found that if all the tuned circuits are peaked at one point in the band that the effective bandwidth will be about 1 Mc. (500 Kc. each side of the centre), however the bandwidth can be increased by stagger tuning the various stages but this will result in a drop in gain.

The other adjustment that may be found necessary is to the level of oscillator injection to the mixer; too much will cause excessive mixer noise and too little will result in inadequate conversion gain. The object is to increase the local oscillator injection

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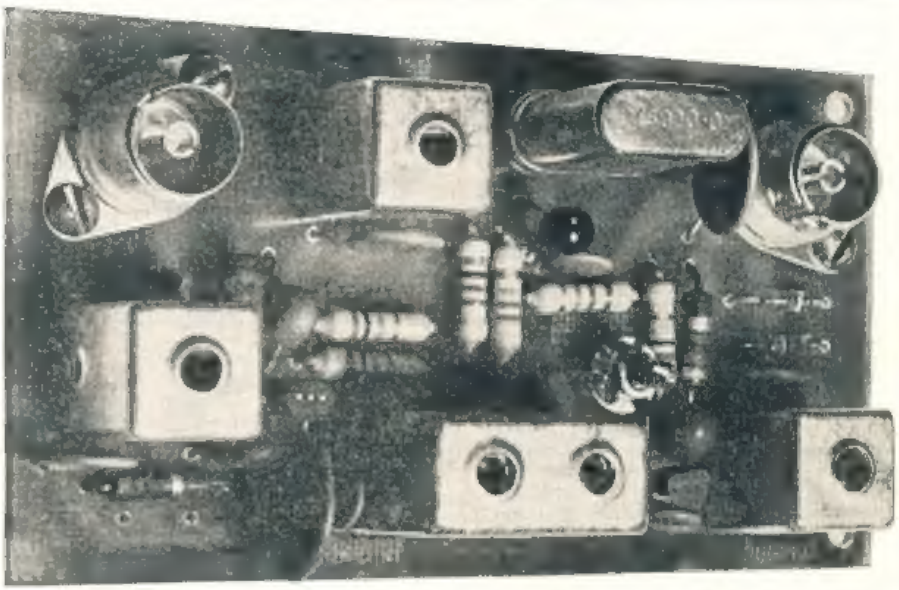
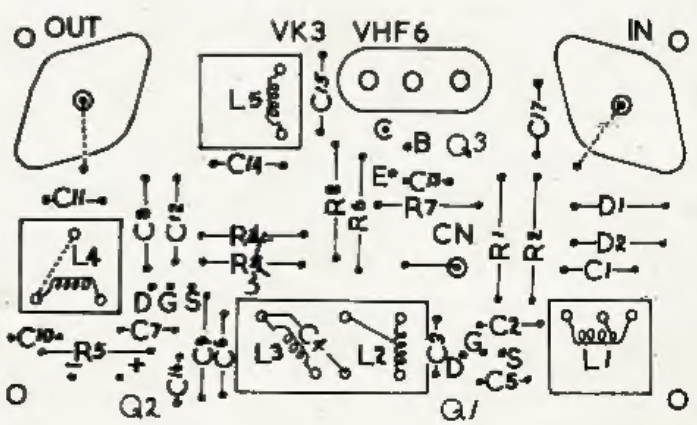




RTTY THE EASY WAY
OR
DRIFTITIS CONTROLLED

JACK KENNER, VK3PB*

ABOUT 18 months ago the writer became interested in that rather fascinating branch of Amateur Radio activity—RTTY. A printer was borrowed and a suitable terminal unit made to drive the printer from the station Galaxy transceiver. When making the T.U. a mark frequency of 1,000 c.p.s. was chosen and provision made for shifts of either 850 c.p.s. or 170 c.p.s. The choice of the 1,000 c.p.s. mark frequency was determined by having some excellent 50-cycle bandwidth filters available on this frequency.

After a few minor problems the gear operated as required and a lot of really enjoyable DX and local QSOs made. For a while this sort of operation was carried on but soon it became apparent that, with the sharp filters employed in the T.U., drift was a major problem and the original minor inconvenience of returning every fifteen seconds or so had become a major chore. So major in fact that either something had to be done or else the RTTY gear was going up for sale!

The Galaxy was tackled first and after a lot of experimenting the drift in this piece of equipment was cured by stabilising the voltage to the filaments of the crystal oscillators and v.f.o. Let me hasten to add that the mains variations at my QTH are very wide and sudden changes in line voltage from 240 down to under 190 are caused by the intermittent use of heavy machinery in a next door timber working factory. This variation had some drastic effects on the filament voltages and was the major source of the drift encountered in the unmodified Galaxy.

With the local problem overcome, it was thought that no further trouble would be experienced when operating, but, regrettably, this was not so. There was little that could be done when the transmitter on the other end of the QSO drifted and it was still necessary to keep re-tuning the (now stable) receiver if good copy was required.

Consideration was given to generating an a.f.c. voltage and applying it to the v.f.o. in the Galaxy, but since this meant some major modifications to the transceiver itself the idea was abandoned. However, the thought remained that if the variation in the 1,000 cycle mark signals from the Galaxy could be made to operate a reversible motor, then this motor could be used as an automatic tuning device.

Various possibilities were explored but in every case the need for some very sharp audio filters was paramount. Finally, the possibility of using tuning forks came to mind. They are easily obtainable, cheap and have very high Q and very narrow bandwidth. They are in fact high class audio mechanical filters. Their temperature co-efficients are good and even normal diurnal changes only alters their frequency by a cycle or so. A couple of tuning forks (middle C 256 c.p.s.) were obtained and one was ground down until it "sang" at about 1,000 c.p.s. as determined by beating aurally against an accurate audio oscillator. The test set up of Fig. 1 was then breadboarded. Output from the audio oscillator was fed into an old earphone coil of about 500 ohms d.c. resistance.

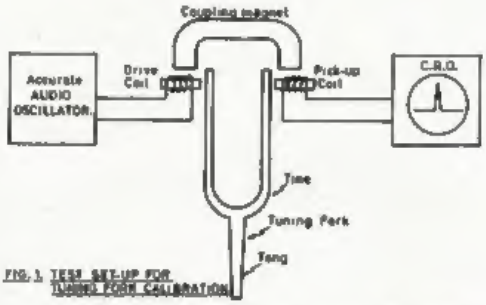


FIG. 1. TEST SET-UP FOR TUNING FORK CALIBRATION

This coil was placed about 0.020" away from one tine of the fork and a second coil placed the same distance from the other tine. A small horseshoe magnet was used to couple the two coils. As the audio oscillator was tuned to the frequency of the fork, the latter was excited into oscillation and a voltage induced in the "pick up" coil. Coupling the pick-up coil to a c.r.o. and manually adjusting the audio oscillator gave the bandpass and the exact frequency of the fork. As anticipated, it was very good. Resonance was sharp and bandwidth was 3-4 cycles at low drive levels (about 1 volt r.m.s.), increasing as the drive was increased. Here was the answer to the filter problem.

As a result of this experiment the final "AFC" unit of Fig. 2 was evolved. The trials and tribulations of its evolution will not be described, but only the operation of the final unit.

Basically it consists of four main sub-sections:

(1) An audio amplifier to process the signal from the terminal unit.
(2) The three "detector" forks and their associated transistor switches and relays.
(3) The drive motor assembly.
(4) The power supply.

The 1,000 cycle mark note used as reference is taken from the mark filter of the T.U. This filter is only 50 cycles wide and thus no signal outside its passband can operate the a.f.c. unit. The level is adjusted by means of the 47K resistor in the primary of the input transformer.

The input transformer is a standard transistor driver unit such as the A & R TD1 with the secondary centre tap not used. The signal is boosted in the audio amplifier, this amplifier being quite standard except for the output transformer which "sees" a load of about 1,500 ohms. An A & R driver transformer type IT631 50 ohms c.t. to 1,500 ohms would suit but something with a higher primary impedance would be preferable. The 0.05 uF. on the secondary is to improve wave form around the desired frequency.

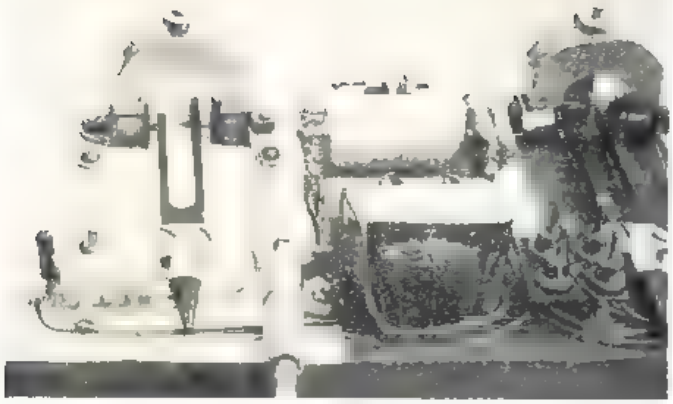
The output signal from the amplifier is split two ways. One leg goes to Q4 which is acting as a switch in the drive motor supply line. In the absence of a signal Q4 is cut off and no current flows through the coil of Relay 3. The contacts R3 in the line to the drive motor open and the motor stops. The second output leg from the audio amplifier is applied in series to the drive coils of the three tuning forks (L1, L2 and L3). For the particular coils used in this unit, 4.5 volts r.m.s. was found to be the optimum drive level.

If the signal is at the 1,000 c.p.s. resonant frequency of the centre tuning fork, a voltage is induced in its pick-up coil (L5) and this signal will cause Q6—which is normally cut off—to conduct. CR1 rectifies the signal and the resultant d.c. is applied to L7 and L9 in the two Carpenter polarised relays which are wired in series. Energising L7 and L9 cause the relay contacts R1 and R2 to connect both motor supply lines to the negative d.c. feed rail and the motor is thus inoperative.

Note that the positive voltage for the emitter of Q6 is derived from the motor supply line and not from the 9 volt regulated supply. This is done to prevent L5/Q6/CR1 from activating the relays when the incoming signal has been centred on 1,000 c.p.s. CR4/CR5, the two 100 uF. 12v. electrolytics, and

View of Tuning Motor Assembly. Note the plastic bottle top "clutch".

* 22 Clarence St., Elsternwick, Vic., 3185.



Above: General View of Unit.

Left: View of two of the Tuning Fork "Filters" showing method of mounting and magnetic coupling.

the two associated resistors are used to provide the correct positive voltage to the emitter of Q6 independent of the polarity of the motor supply.

Just so long then as the feed signal is 1,000 ±5 c.p.s. the motor is not activated. Since the motor is connected to the main tuning dial of the receiver the v.f.o. tuning remains unaltered.

Suppose now the signal drifts low. As soon as it reaches 995 cycles L1 energises tuning fork F1, L4 picks up a signal which allows Q5 to conduct, this signal is rectified by CR2 and L8 is activated. This causes R1 to take up its "positive" position while R2 stays "negative". The motor then drives the receiver tuning knob in the direction to counteract the drift, i.e. the mark signal is returned to 1,000 cycles and the motor stops.

If the signal drifts high, as soon as it reaches 1,005 c.p.s. then F3, L6, Q7 and CR3 come into play, L10 is activated and the supply voltages to the motor are reversed, i.e. R1 stays "negative" while R2 goes "positive". The motor drives, this time in the opposite direction, and once again the receiver is tuned to counteract the drift, cutting off when it reaches 1,000 c.p.s.

SW1 is included as a reversing switch for use on "opposite" sideband. The driver motor is a 24-volt polarised unit fitted with a high reduction gear train obtained from surplus radar. The direction of rotation is a function of the polarity of the drive voltage. With the supply connected round one way the motor goes clockwise. When the supply is reversed the motor goes counter clockwise. In the unit described the motor is mounted on a heavy baseplate and is adjusted by means of three screwed legs in the baseplate so that the centre line of the drive shaft is concentric with the centre of the Galaxy tuning knob. No modifications are necessary to the receiver tuning arrangements since the "couple" on the motor is a plastic bottle top which fits loosely over the tuning knob. A simple rubber band doubled round the tuning knob acts as the actual coupling element and the motor can be connected to the receiver by pushing the baseboard into position. Very simple! Very effective! Very cheap! The photograph gives an idea of the mechanics of the drive unit. The power supply is straight forward and must be able to give 15 volts at about 200 mA. The supply for all the transistors (except Q6) is regulated at 9 volts by the zener diode CR6.

GENERAL

Whilst moderately complex, the unit has outstanding performance. Once tuned to the required signal it stays tuned. The receiver can be "locked" on to the distant station and left unattended for long periods—all day if necessary—and imperfect copy due to drift is eliminated.

As far as the writer is aware this is the first time such an a.f.c. control for Amateur RTTY has been described. A.f.c. units must obviously be used by Post Offices and other official communications bodies all over the world but they are **very** complex devices using a lot of very accurate and very specialised low frequency crystals. As such, they would be outside the reach of the average Amateur. This unit is not.

As a result of four months of "on air" trial many flattering remarks—and many queries—have been forthcoming from others interested in RTTY. Eric VK3KF—the doyen of Australian RTTY'ers—has had many discussions with the author and is currently developing a similar unit using the torodial filter/discriminator approach.

One constructional point that needs some explanation is the way in which the tuning forks are brought on frequency. These forks are normally obtained resonant on Middle C or 256 c.p.s. It is necessary to remove metal from the tines until the fork is resonant at the required frequency (1005/1000/955 in the case described). Since Middle C forks come in a variety of shapes, some long and thin, others short and fat, it is not possible to specify in this article how much metal must be removed. However, the tuning procedure will be the same irrespective of the actual dimensions of the fork used.

The first step is to rough grind the fork ends, removing equal amounts of metal from each tine. After each grinding the note is compared aurally with an audio oscillator/speaker combination set to the desired frequency. As the note gets closer to that required a smooth file is used and only small changes made. Finally the test set-up of Fig. 1 is used to get the fork exactly on frequency. Since the coil coupling

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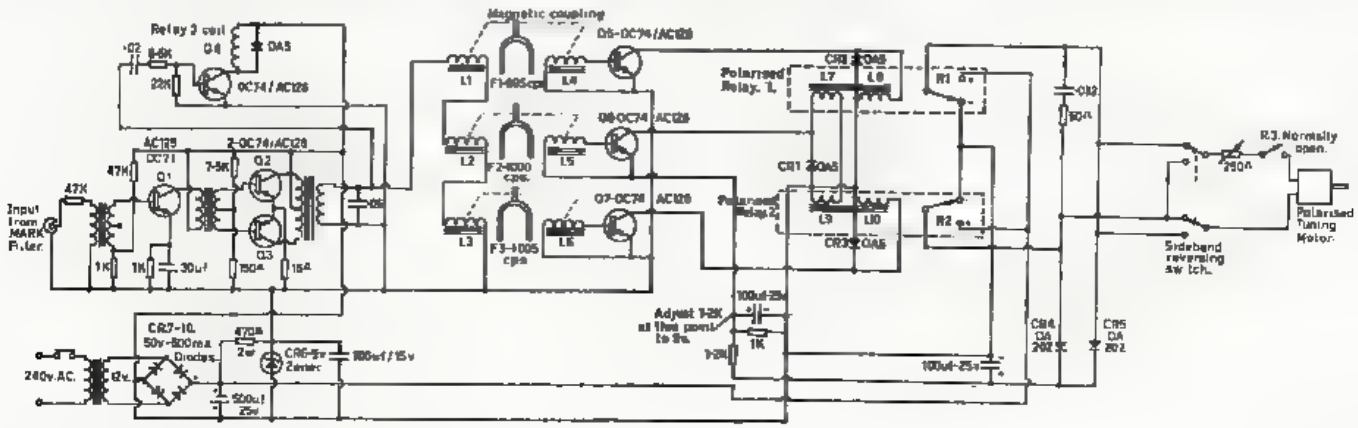


SIDEBAND

Sub-Editor: PHIL WILLIAMS, VK5NN, 37 Wiana Rd., Coromandel Valley, 5051

V.H.F. S.S.B. DX

Already DX is to be had on 50 Mc., and many of the VK boys are preparing to avail themselves of the better DX ability of sideband. The new regulations which are due to be published in "Amateur Radio," and which should be available in the new Handbook for the Guidance of Amateur Operators, should make it possible for some very useful s.s.b. to be beamed north and north-east for the DX season in January and later. They estimate that the Handbook will be printed and distributed within a few months of publishing these notes.

Apparently some of the stations on 50 Mc. to the north of us have some difficulty in receiving sideband. This is a shame and if somebody could publicise the fact that we are going to use reasonably high powered sideband transmission, the DX stations may be able to prepare their receivers. It may be worth a letter to Sam Harris who writes the V.h.f. Notes in "QST".

SIDEBAND GATHERING—1968

The honorary secretary for the next Hamilton, Vic., Sidebanders Gathering for 1968, Dud VK2DQ, advises that this will be held during the Australia Day week-end at the end of January. Most of those who have attended previously (1964 and 1966) have been sent notices and any others who have frequented the top of 80 mx with the "Sewing Circle" and would like to come should write to Dud for details and application form.

SIDEBAND ON AN OLD RECEIVER

I have been asked again to outline the most desirable modifications to be made to an old receiver of the 1940-50 vintage to make it work "properly" on sideband. On following up the meaning of the word "properly" in the questioner's mind, it is apparent that he usually wants the old box transformed into a 75A4 or the equivalent, but even so there is quite a lot which can be done to make the receiver a useful item of gear.

A brief run through the major points may help anybody who has an old SX24, "Super-Pro" or even an AR7.

Stability.—Much has been written about this but the oscillator stability can always be improved by fitting a VR105 or similar tube for the h.f. oscillator and b.f.o. supply. This tube and its dropping resistor should be located away from the oscillator section, in the well ventilated section of the receiver. It is a good plan to replace the old 5Y3 or 80 with a set of silicon power diodes, and use the rectifier socket (re-wired or replaced) for the VR tube.

More heat may be removed by running the audio output tube (say 6V6 or 6F6) with about 150 volts on the screen and about 20 mA. of plate current instead of 40 mA. or so. It usually needs 600 to 800 ohms of cathode resistance to achieve this, and a watt or so of audio is still available.

Another oscillator tube such as a 6C4, which has a low consumption heater, will often reduce heating and improve stability. The original octal socket hole may take a metal plate with the 7-pin miniature socket (ceramic or P.T.F.E.) sitting in the centre.

Additional cabinet ventilation in the top, sides and back can be had by letting in some pieces of perforated metal, or cutting long horizontal parallel slots with a nibbler. The latter can give quite a pleasing result.

Bandspread and Tuning Rate.—Those old receivers made for c.w. usually have reasonable tuning rates on the bandspread knob. If such is not the case, it is usually on 10 and 15 metres that the rate is too rapid, and I can only suggest the addition of a small 6 : 1 planetary drive on the front of the panel, with a big knob to hide it, or add converters for these bands (crystal) and tune at a lower frequency. The converter usually solves a stability problem and a sensitivity problem, too.

I consider that a tuning rate of about an eighth of an inch per kilocycle is about the place for tuning sideband—i.e. measured on the circumference of the tuning knob. Use a skirted knob and mark these around the edge. It is helpful for estimating signal bandwidths, separation and for moving your own transmitter by "X" kilocycles to dodge some interference.

Intermediate Frequency Bandpass.—Most old crystal filters are not ideal for sideband, but the least selective "crystal" position is generally used. The "narrow" position is too restrictive and intelligibility suffers as a result.

If your receiver has no crystal filter, then I recommend you try two pairs of back-to-back i.f's. One is not enough at 455 Kc. Couple between transformers with a 10K to 20K resistor, and add about 12 pF. of capacitance to each winding which does not have a valve plate or grid connected to it.

You may be able to add a two-crystal, half-lattice filter, using surplus channel 44 and 45 crystals of the FT241 type, but this is not recommended as these crystals are now old and those remaining have been well picked over. The addition of a mechanical filter (2.1 Kc. bandwidth) is recommended and the money outlaid is worth "saving up" to get the very big improvement in rejection in unwanted signals. For their size, their performance is amazing. Just tune the input and output windings with capacitors as recommended by the maker and couple in and out with small condensers—usually less than 10 pF. No terminating resistors are needed.

B.f.o. and Product Detector.—Although many will tell you a diode is okay for receiving sideband, and I do not deny it—the use of the existing diode usually prevents the use of a.g.c. for sideband reception. If the product detector does nothing else, it separates the b.f.o. signal from the detector, and allows the rectified received signal to be used for deriving a.g.c.

The simplest product detector I know is that using a mixer/oscillator tube such as a 6AN7 tube. An ordinary broadcast type oscillator coil suitable for the tube in question may be made to work at 455 Kc. by placing 1,200 pF of fixed mica condenser across it and adding about a 50 pF. variable for the b.f.o. tuning condenser. The tuning slug will put the b.f.o. on 455 Kc. and the variable will then tune about plus and minus 3 Kc.

The signal input to the product detector should be reduced in strength by putting 100 pF. from signal grid to earth, and coupling from the last i.f. transformer secondary via a 10 pF. or small variable. With about 22K of plate load resistor in the heptode (plus the r.f. filter resistor or r.f. choke, of course) it should be possible to switch from diode to product detector on an a.m. signal, without too much change in level.

To align the i.f. transformers, the method I have found most useful is to put the b.f.o. condenser in mid position, adjust the b.f.o. slug to put the b.f.o. on 455 Kc. exactly (signal generator zero-beat)—then go along and adjust each slug in the i.f.t's for lowest pitch of the noise peak coming from the product detector with signal generator **off**. If a mechanical filter is added, it may be necessary to shift the b.f.o. slug to the centre frequency of the filter by leaving the condenser in mid position and tuning the b.f.o. coil slug for lowest pitch noise.

A.g.c. for Sideband.—This will probably be the modification demanding more sweat and tears than the preceding because it will require changes to the a.g.c. time constant resistors and capacitors to give fast attack and slow decay. The a.g.c. decoupling condensers on the grids (or tuned circuits) of the controlled stages should be small (say 0.01 uF.), and the a.g.c. voltage derived from a low impedance source and fed to the control line via a silicon diode

If you can find room on the chassis for a 12AU7 and a 3 : 1 audio transformer, then I recommend strongly that you use the audio-derived "hang" a.g.c. circuit now given in all issues of the A.R.R.L. Handbook. It was described in "A.R." last year.

If you use this audio derived a.g.c. you will **need** an S meter to tell you how strong signals are, because you will not be able to tell by listening. A strength 3 signal sounds like a 10 over 9 one on a quiet band.

The standard S meter connected from the cathode of a controlled i.f. stage to the cathode of the a.f. stage, with zero and sensitivity control resistors, is usually satisfactory.

(Continued on Page 13)

SIX AND TWO CROSS-BAND DUPLEX MOBILE

ROY HARTKOPF, VK3ZOM*

HAVE you ever sat in the middle of an intersection waiting for the other station to finish the over so that you can ask which way to turn? Or gone three miles past a turn off because the fixed station started describing his rig and forgot to give you directions? Or have you started an over at 5 and 9 and found, when you put it back, that you had been talking to empty space? If you have experienced any of these frustrations, then you are a potential customer for cross-band duplex mobile working.

The writer had six metre mobile in his car for some years but was missing out on all the two metre contacts. So he decided to build some mobile two metre gear as well. To be any use for mobile, it was necessary to be able to change from six to two at the flick of a switch. At the same time, space and cost dictated that as much of the gear as possible should be common to both. With two aerials, a common power supply, common microphone and modulator, it was only a short step more to adding facilities for simultaneously transmitting on one band and listening on the other and so the cross-band duplex mobile rig came into being.

The two separate aerials are not really a problem. The six metre rig uses the normal car radio aerial mounted on the bonnet and the two metre aerial is a 19" length of wire held in a terminal which is mounted on the rear centre part of the roof. When the rig is switched off the six metre aerial is connected directly through to the car radio for normal broadcast reception.

From the block diagram (Fig. 1) it will be seen that there are three basic units; first the transmitters, converters and switching, then the modulator and power supply (both transistorised), and finally the normal car radio. The first and second units are connected by screened six-way cable, while the car radio is kept as an entirely separate unit and if you are prepared to do without a noise limiter it need not be touched at all.

To allow for continuous operation while mobile and for several hours when parked, a power of ten watts was used. The transmitters are almost identical physically, each being on a 7" x 2" x 1½" chassis and using a 12AT7, 12BY7 and QQE03/12 as the final. It is hoped to describe these together with the converters at a later date and also the power supply and modulator. However, the idea behind this article is to help anyone who is interested to make something up from existing six and two metre gear.

Many Amateurs seem terrified of anything with complicated switching, but the switch layout diagram (Fig. 2), together with the block diagram in Fig. 1 should help to convince them that the switching needed is not so difficult after all.

* 34 Toolangi Road, Alphington, N.20, Vic.

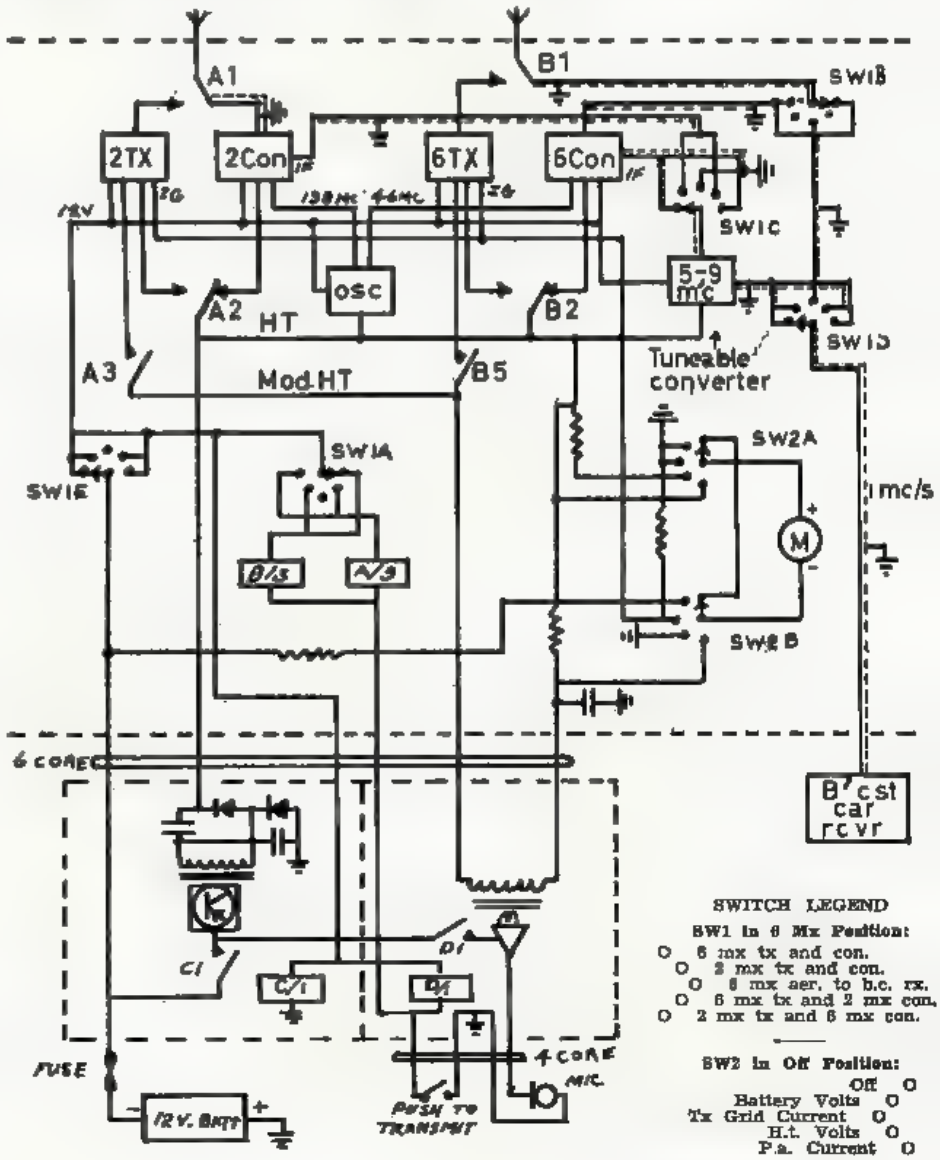
In the rig the switch wafer comprising SW1 A and B was nearest the panel so as to be close to the relays and aerial lead. All the r.f. leads were screened and earthed at one point. It was found that apart from one or two "spots" there was surprisingly little interference or feedback when working cross-band either way.

Both transmitters use crystals oscillating at frequencies well above the 6 to 10 Mc. tunable converter. The common 12AT7 oscillator for the v.h.f. converters uses a 46 Mc. crystal, giving a 6 Mc. i.f. for 52 Mc. and the crystal frequency is tripled in the other half of the 12AT7, giving 138 Mc. This again gives an i.f. of 6 Mc. at the bottom of the two metre band. Normally the car receiver is set at a spot-free position round about 1 Mc. and the tuning is done by the tunable converter. If you are prepared to settle for 1 Mc. coverage you can have a fixed second converter and use the car radio for tuning.

For those who find the switching circuitry of Fig. 1 confusing, here is a brief description of the operation of the function switch SW1.

The off position, which has already been mentioned, routes the six metre car radio aerial through SW1B and SW1D direct to the car receiver and everything else is switched off.

In the six metre position, the one in which the switch arcs are drawn, SW1E puts the live battery on to all the heaters, to 6/1 which operates starting up the h.t. supply, to D/1 and through SW1A to relay B/3 the six metre transmit-receive relay. Meantime, the SW1B connects the six metre relay contacts B1 to the six metre converter input and SW1C connects the output



SWITCH LEGEND

SW1 in 6 Mx Position:
- 6 mx tx and con.
- 2 mx tx and con.
- 6 mx aer. to b.c. rx.
- 6 mx tx and 2 mx con.
- 2 mx tx and 6 mx con.

SW2 in Off Position:
- Off
- Battery Volts
- Tx Grid Current
- H.t. Volts
- P.a. Current

to the tunable converter. Finally, SW1D connects the tunable converter output to the car radio receiver

When the "push to transmit" switch on the microphone is operated the modulator relay D/1 and the transmit-receive relay B/3 are operated. Contact D1 switches on the modulator. Contact B3 supplies modulation to the six metre transmitter; contact B2 supplies h.t and contact B1 connects it to the six metre aerial.

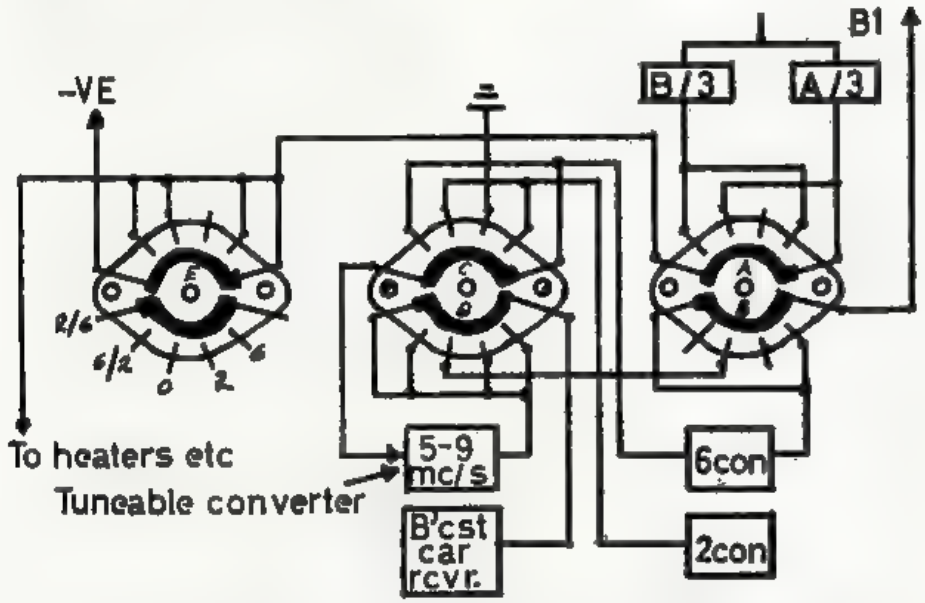
The next position of function switch SW1 does exactly the same for the two metre transmitter and converter. In this case the "push to transmit" switch operates relay A/3 instead of relay B/3. Since the two metre converter is permanently connected to change over contacts A1 there is no two metre equivalent required for SW1B.

The two most clockwise positions of function switch SW1 are used for cross-band working. The extreme clockwise position—listen on six and transmit on two is almost the same as the extreme anti-clockwise, normal six metre position. The only difference is that SW1A connects A/3, the two metre relay, instead of B/3, the six metre one. This means that when the "push to transmit" switch is operated the two metre transmitter is put on the air; and since relay B/3 is not operated, the six metre converter remains in action and so we have cross-band duplex transmitting on two and listening on six simultaneously.

In the last but one clockwise position the two metre receiver remains in action all the time while the "push to transmit" switch operates the six metre transmitter.

The meter switch SW2 (must be non bridging or break before make type) is entirely independent of the function switch and will meter whichever transmitter is in operation at the time. The circuitry here is quite standard and the series and shunt meter resistors are of course chosen as required.

After several months of duplex cross-band working, the writer is completely sold on it and never uses the "mobile monologue" section if he can possibly avoid it.



sw1 detailed wring switch shown in 2M-TX 6M-RX posn.

SIDEBAND

(Continued from Page 11)

Receiver Re-Sale Value.—Old receivers of the type mentioned brought higher prices unmodified some 5 or 10 years ago, but their value is now less than a 1936 Pontiac—so don't be afraid to modify your old faithful "hearing-aid". There may be some years of life in it, yet.

Finally, Muting.—Don't forget that you have to silence your receiver while you are transmitting, but let it come back to life quickly when you return to "receive". It is possible to do this in so many ways that I shall simply state the requirements and let it go at that. You could feed about 40 volts of your transmitter bias to the receiver a.g.c. line through a diode, i.e. just enough to mute it.

For netting, however, you must restore the receiver gain while the transmitter is on, but with the transmitter audio to the modulator shorted out, so that only "carrier" at low level leaks through to the receiver. The audio a.g.c. will hold its level.

Yes, the sideband part is easy, it's all this switching stuff that gets so complicated.

73 for now, Phil VK5NN.

A. C. (CHAS.) HAWKER, VR1B

Pictured is the rig in use by Chas. Hawker who operated station VR1B from Tarawa in the Gilbert Islands during the period 1956-1963. It was thought that due to the large number of enjoyable contacts had with VK a description of the equipment used might be of interest.

The receiver should be immediately recognised as a vintage SX28, although considerably modified for improved c.w. and s.s.b. operation (article "A.R.," March 1956). The same receiver was used at VK1AC (Macquarie Island 1954) and VK0AB (Davis 1957), so is widely travelled!

The transmitter is a home-brewed effort built around the inevitable Geloso v.f.o. featuring alternative crystal control, break-in keying, all-band tank circuit, in-built solid state power supply, a.m. modulator and 150 watts input to a pair of 6146s. The latter are also switchable to serve as AB1 linear amps. for s.s.b. service and when in this mode are driven from the much-modified 10B exciter seen atop the transmitter.

The home-brew s.w.r. meter is perched on top of the 10B and the remote v.f.o. for the s.s.b. rig sits in a handy position right top of the receiver. The microphone is a dynamic. Antennae in use were W8JK and a 170 ft. long-wire 35 feet in the air. The latter was erected out over the sea, which accounted for its excellent performance and favoured use!

Over six thousand contacts were logged and a total of 178 countries worked. W.A.S was achieved in a few short months early in the peace. Conditions generally were excellent during 1959-60 but 1961-65 saw many occasions when it was difficult to work VK and even the West Coast Ws faded completely from the scene. Indeed there were many occasions when a CQ from VR1 didn't bring a solitary reply! From VR1 it is extremely difficult to hear any European stations and in six years successful openings of any worth probably numbered less than a dozen.

An Australian-made Crammond transceiver was used during occasional maritime mobile excursions, including the Phoenix and Line Islands trip in mid 1964. S.s.b. gear was loaned by KB6EPN during the s.s.b. phase of the Phoenix Islands expedition. Chas, ex VR1B, now operates a Collins S Line from VK3IB at the home QTH at Dimboola, Vic., where he now handles a newsagency business.

RTTY THE EASY WAY

(Continued from Page 9)

magnet affects the resonant frequency of the fork, it is essential that final trimming is done with the fork mounted and driven as it will be when in operation.

This article has not attempted to give exact mechanical details. Rather it has been its purpose to present a practicable solution to a very real Amateur RTTY problem. The diagrams and photographs will assist those who would like to make something similar. In VK3 at any rate the polarised relays are in reasonable supply from disposals sources and the writer has a few suitable fork coils available for those really interested.

As a closing thought, there seems no reason why the c.w. fanatic could not adapt the system to his favourite mode.

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Low Impedance input: 1K ohms.
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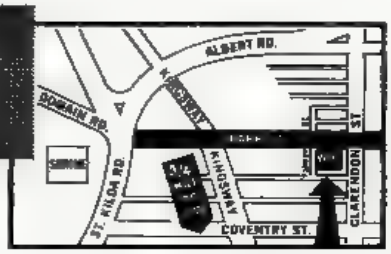

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IMPROVEMENTS TO SWAN 240 TRANSCEIVER

JOHN D. WARD, VK5WD (EX G3HDW)*

SOON after acquiring one of these transceivers the writer realised that, although basically of good design, some improvements could be made which would improve the performance of the equipment

The modifications described in this article concern changes to overcome the following deficiencies —

1. Noise produced by the 12BE6 mixer valve, resulting in a somewhat poor overall signal-to-noise ratio.
2. The relatively short life of the 6DQ5 p.a. valve experienced by some users of this equipment.
3. The lack of correct tracking of the exciter tuned circuits over the full range of any band. This results in a variable amount of drive to the grid of the p.a. valve, depending on the frequency set by the v.f.o.
4. Hum emitted from the speaker when a combined speaker/power supply is used (depending on the power supply cable loom used to connect the power supply to the transceiver, this may not occur with all installations).

Other modifications, such as low band coverage on 80 metres down to 3.5 Mc., grid block keying and the provision of an S meter will not be mentioned in this article since they have been referred to in Swan service bulletins and other publications.

IMPROVING SIGNAL-TO-NOISE RATIO

To improve the signal-to-noise ratio either the mixer, which generates most of the noise, must be modified or else the r.f. amplifier must have sufficient gain to amplify an incoming signal to a level whereby it can override the mixer noise. An investigation into the circuit indicated that since a multi-grid valve was used for the mixer, it would be easier to modify the r.f. stage.

In the original circuit the screen grid of the 6BA6 r.f. amplifier is fed by a dropping resistor which is common to a similar electrode in the mixer. This results in a short grid base for the r.f. amplifier with the result that this stage is biased back considerably when a signal is tuned in and the a.g.c. line voltage increases in negative potential. To improve the effective grid base of the 6BA6, and thus obtain a more gradual and progressive reduction of gain on moderate and weak signals, the screen grid of the r.f. amplifier should be fed via a high value of series resistance.

To make this modification proceed as follows: Disconnect the lead connecting pin 6 of the 12BE6 mixer to pin 6 of the 6BA6 r.f. amp. Remove the existing 22K ohm 1w. resistor connected to pin 6 of the mixer and substitute with a 33K ohm 10% tolerance 1w. type. Decouple pin 6 of the mixer to ground with a 0.01 uF. 500v. disc ceramic capacitor. Connect a 47K ohm 10% tol. 1w. resistor between pin 6 of the r.f. amp. and the h.t. feed end of the new 33K ohm resistor which has previously been installed (the h.t. feed point is at a tag strip). Remove the existing 47 ohm resistor connected to the cathode, pin 7, of the r.f. amp. and substitute with a 68 ohm 10% tol. ½w. type. This completes the modification and your circuit should now look like Fig. 1.

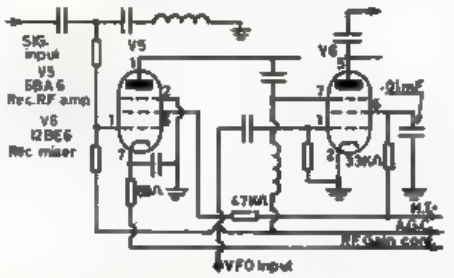


Fig. 1.

Note: Only values of new components shown.

CHANGING THE P.A. VALVE

The original 6DQ5 valve is not very tolerant of being subjected to high operating temperatures, extended periods of tuning-up or the rough treatment that often occurs with mobile operation.

A very much better valve, although it is more expensive, is a type 8236 which is a plug-in replacement for the 6DQ5. To fit this valve, a slight mechanical modification must be made to the base inside the p.a. compartment and the anode tap cap must be opened out slightly to accommodate a slightly bigger top cap. There is no need to change the base or to make any electrical modifications.

Some Amateurs may experience difficulty in obtaining 8236 valves, but it is understood that Mullard-Australia has stocks available via their distributors.

EXCITER TUNED CIRCUITS

To improve the tracking of the exciter tuned circuits, the values of the fixed capacitors wired across coils L3-75, L3-40 and L3-20 should be reduced in value. These components are situated on the top of the chassis in front of the screened p.a. compartment. The following changes should be made:

Remove—

75 pF. capacitor across L3-75.
180 „ „ „ L3-40.
50 „ „ „ L3-20.

Substitute—

47 pF. 10%, 500v., N.P.O. disc ceramic across L3-75.
150 pF. 10%, 500v., N.P.O. disc ceramic across L3-40.
27 pF. 10%, 500v., N.P.O. disc ceramic across L3-20.

If disc ceramic capacitors are not available, 500v. good quality mica types will do just as well.

When this work has been completed re-align the exciter tuned circuits according to the instruction manual. This operation entails the connection of a dummy load to the antenna socket, inserting a little carrier and adjusting the slugs in the coils for maximum output. The adjustment should be made at approximately the centre frequency of each range.

HUM

Some models of this transceiver suffer from an objectionable level of hum in the speaker. It took the writer some considerable time to locate the cause of this, especially since the hum level did not alter in intensity when the h.t. supply was switched on or off. The reason for this is that in the original Swan P.U. circuit there are two ground return paths from the chassis of the P.U. to the main transceiver chassis.

The first ground return path is via the direct connection between the P.U. and transceiver (pin 6 on the connectors to the linking cable loom). The second return is not so obvious. It is formed by the path through the speaker voice coil (one side is grounded) being connected via the cable loom, pin 12, to the low resistance secondary winding of the output transformer back to the chassis of the transceiver. Since several amps. of heater current flow through the wiring linking the ground return between the two units, some a.c. current is allowed to flow through the speaker coil.

The solution to this problem is to remove the ground connection from the speaker coil in the P.U. and return it to ground at the transceiver chassis, using the spare pin (11) on the Jones' connectors at each end of the connecting cable loom. This will mean the use of an additional lead between the existing connectors. Alternatively, bring the speaker connections out directly at the transceiver chassis and avoid grounding one side of the speaker coil to the P.U. chassis.

PERFORMANCE

With the improvements described, the overall performance of the transceiver is considerably improved. Not all users may wish to carry out all of the modifications described, but the simple changes to the r.f. amplifier circuit are earnestly recommended to anyone who desires an improvement in the signal-to-noise ratio for very little effort spent in altering a few components.

Many Amateurs who are using modern commercially made equipment appear to be reluctant to even take the cover off a transceiver let alone contemplate modifying the circuitry. However, these people should realise that most commercial equipment is built to a price level and a compromise design is the usual result. The old adage "nothing ventured, nothing gained" is certainly true in this case!

* 19 Caspar St., Fairview Park, S.A., 5126.

6-METRE CONVERTER

(Continued from Page 7)

until the instantaneous sum of the oscillator and signal voltages, with a strong signal, is almost to the point of driving the mixer gate to zero bias. This, however is difficult to measure as the average Amateur has not got access to the necessary test equipment so the easiest way is to increase injection (by peaking the screw core in L5 or by varying C12) until just prior to the point where the mixer noise rises sharply. The injection may have to be reduced still further if cross-modulation is experienced on strong signals. (Another possible source which should be checked if cross-modulation is a problem is instability in the r.f. stage.)

The converter can be easily adapted to cover a wide range of input frequencies covering the h.f. and the lower portion of the v.h.f. bands by simply altering the coils and using a crystal of the appropriate frequency. The h.f. converter in "A.R." September 1967 is an adaption from this circuit. The upper limit of this design is probably in the 70 to 80 Mc. region, due mainly to the availability of crystals at reasonable cost and also by the drop in gain of the single r.f. stage. Above this frequency a second i.f. stage or possibly a cascode arrangement would be desirable to obtain adequate gain. The range of i.f. output frequencies given in the table were selected as it was felt that the majority of Amateurs use output frequencies in this range (the adjustment of the screw core covers a reasonably wide frequency range to cater for i.f's around the values given). If other i.f's are required, then it is a simple matter to alter the number of turns on L4 as required.

A number of kit sets consisting of the printed circuit board (silk screen printed on the reverse side), transistors, coil former assemblies, neutralising capacitor and construction information have been distributed to VK3 V.h.f. Group members and to some Interstate Amateurs at a price of $5.50 each plus 50c postage.

It is anticipated that a further limited number of these kit sets and/or component parts will be made available and further information can be obtained from the Converter Committee, VK3 V.h.f. Group, P.O. Box 36, East Melbourne, 3002.

Work is in hand to develop designs for both the 144 and 432 Mc. bands and it is anticipated that this work will be completed shortly.

— • • • —

PROVISIONAL SUNSPOT NUMBERS

AUGUST 1967

Dependent on observations at Zurich Observatory and its stations in Locarno and Arosa.

Day	R	Day	R	Day	R	Day	R
1	139	9	94	17	85	25	98
2	119	10	87	18	114	26	105
3	91	11	79	19	116	27	107
4	85	12	68	20	108	28	119
5	80	13	70	21	113	29	111
6	95	14	86	22	104	30	121
7	90	15	91	23	110	31	124
8	119	16	77	24	104		

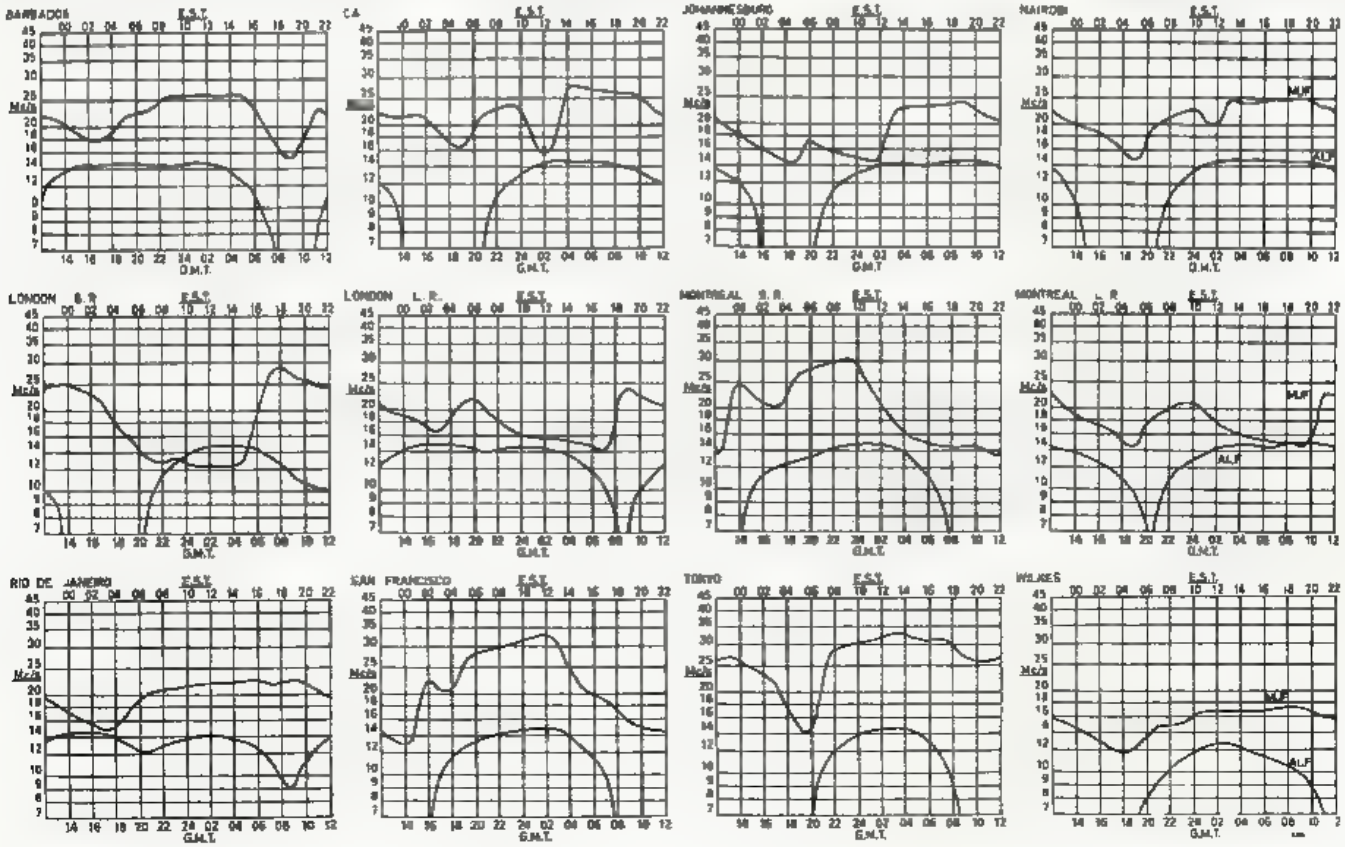
Mean equals 99.1.

Smoothed Mean for February 1967: 78.4.

Predictions of the smoothed monthly sunspot-numbers for the coming six months: September 96, October 97, November 98, December 101, January 103, February 104.

PREDICTION CHARTS FOR NOVEMBER 1967

(Prediction Charts by courtesy of Ionospheric Prediction Service)



FIELD EFFECT TRANSISTORS*

FETs May Be Lowest Noise, Lowest Cross-Modulation, Lowest Priced Devices So Far!

FIELD Effect Transistors (FETs) are a family of devices that have been in the laboratory for some time in inferior forms. Now, by using recently evolved techniques used in ordinary bi-polar transistor manufacture, they have emerged as an extremely commercially attractive device. They appear to have all the virtues of valves and transistors and yet none of their vices and have filled a gap in the electronics field that previously hindered developments in many areas.

The FET is quite a separate device from the bi-polar or ordinary transistor. It is reasonable, therefore, to expect a distinct new set of characteristics.

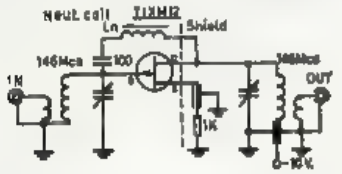


FIG. 1. GROUNDED SOURCE NEUTRALIZED R.F. STAGE. - 15-20 DB GAIN.

I think it is important not to confuse FETs with ordinary transistors, and it is unfortunate that "Transistor" is used as part of their title. Broadly, they have the following characteristics:—

- High to almost infinite input impedance, which in most cases is very much higher than valves.
- Capable of very low noise figures from d.c. to v.h.f. frequencies, and often this range is covered by the one device.
- Low susceptibility to cross-modulation and inter-modulation due to strong unwanted signals in the passband of r.f. and mixer stages. Here again, some later types are superior to valves and far superior to transistors.
- Apparently no limit to their power handling or maximum frequency, apart from inferior fabrication techniques at present in use.
- No "off-set" voltage requirement.
- Available in forward or reverse bias types and in P or N channel types with insulated or junction gates. This provides more versatility than any other device.
- Can be positive, negative or zero temperature co-efficient, according to bias conditions and therefore very useful in d.c. amplifiers.
- Require only one diffusion during fabrication as against transistors which may require as many as four.
- Operate at medium voltages and are compatible with transistors in many new circuit designs.
- Have the prospect of being very cheap due to the simpler manufacturing methods.
- Have increased the component density capability of integrated circuits.
- Very much more resistant to radiation than transistors.

However, to off-set this fine list of characteristics are a few disadvantages:

- FETs still exhibit a fairly high resistance when turned on "hard". This resistance may be several hundred ohms, which is many times larger than a transistor of similar dimensions.
- Another disadvantage is gate breakdown. This is where stated charges on the gate of the **insulated gate type** FETs cause catastrophic failure. It should be noted that this is only a danger in the **insulated gate** FET, MOS-FET or IGFET. The cheaper and more common **junction FETs** can be handled with the same respect as other semiconductors.

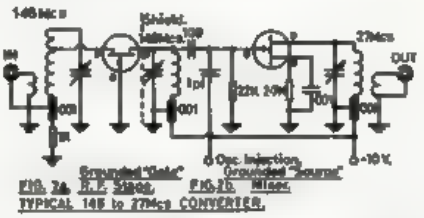


FIG. 2A. R.F. STAGE. FIG. 2B. Mixer.
TYPICAL 146 to 27Mcs CONVERTER.

Some earlier FETs have had other disabilities which have been overcome in later ones by the large multitude of researchers who have taken such a keen and sudden interest in them. It is hoped that their remaining disadvantages may be likewise overcome.

In my limited and short experience with FETs, I have found they do all they claim in the tests I have given them. However, here are a few additional features that I have observed:

I have found that the audio FET 2N4360, apart from its expected low noise, seems fairly immune to induced key-clicks and electrical household appliance interference which usually plagues record-players, tape recorders and the like where bootstrapped transistor front-ends are used. A similar immunity to r.f. interference from the Adelaide Airport radar has been noted. This is unprecedented in any high-gain audio equipment ever used at my location in the foothills.

I am currently using the germanium P channel junction FET (TIXM12) both as r.f. stage (see Fig. 1) and mixer (see Fig. 2B) on 146 Mc. As a mixer, the TIXM12 has a lower conversion gain than the 2N3563 trantransistor used previously although the gain is probably comparable with a triode valve mixer. The TIXM12 r.f. stage (see Fig. 1) is in grounded source and, as expected with 3 pF. feedback capacity, had to be neutralised for stability and maximum gain. This r.f. stage should provide a gain of about 15 to 20 db. and seems to do this. I also tried a grounded-gate configuration (see Fig. 2A) which did not give the same gain but did not require neutralisation either.

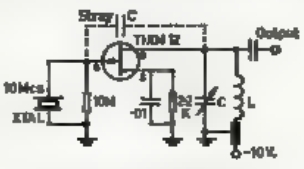


FIG. 3. TYPICAL CRYSTAL OSCILLATOR.
(Claimed to have high stability.)

However, the real advantage of low susceptibility to t.v. interference was fully realised even at Mt. Lofty where the FETs proved better than my valve front-end in a check at the Mt. Lofty summit (R.F. Hill).

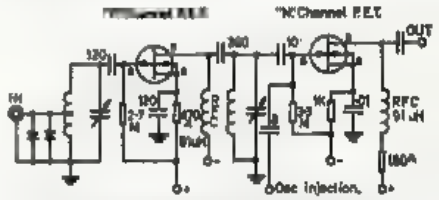


FIG. 4. RECEIVER FRONT END DESIGN USED BY THE "DAVCO Co."
("RFCs in"Drain"circuits used for ease of switching.)

I have also had the TIXM12 performing as an oscillator (see Fig. 3). It seems this FET was only as good as other transistor oscillators I have had working, which is still quite excellent. The only bonus here may be in a g.d.o. ("gate" dip oscillator) which I have had going in prototype form.

This short discussion will, I hope, introduce a few, at least, to the FET. I have avoided the theory of operation of these devices since there is quite a deal being printed in most of the periodicals these days. Instead, I hope this may serve as a bit of an appetiser and encourage further reading.

—Rick VK5ZFQ.

". . . and who might you be calling 5 by 9?"

*Reprinted from "The South Australian Wireless Institute Journal," May 1967.

VICTORIA'S FIRST WIN

Congratulations Victoria for your high marginal win in the R.D. Contest. This success has now enabled every Division to hold the Trophy.

The log entry remained around the usual figure, which now is less than 10% of the total number of licensees for the whole of Australia. This has not followed the national increase of licence growth. 13% of the total entry were Z licensees.

With peak propagation expected in 1968, can it be anticipated that participation percentage will improve?

—Neil Penfold, VK6ZDK, for F.C.C.

DETAILS OF STATE SCORES

	Log Entry	Licensees	% Participation	Total State Points	State Score
VK2	90	1697	5.3%	20,989	81.34
VK3	64	1655	3.9%	20,397	85.32
VK4	49	634	7.7%	14,639	82.18
VK5	118	694	17.0%	24,048	79.52
VK6	62	398	15.2%	13,902	79.51
VK7	52	199	26.1%	8,624	75.64

AUST. CAPITAL TERRITORY

(Award Winners in Bold Type)

Phone—

VK1AN	169 pts.	VK1QL	849 "
1BA	129 "	1VF	998 "
1DR	41 "	1WT	77 "
1JL	640 "	2BLJ/VK1	242 "
1KM	271 "	1ECQ	14 "
1ML	21 "	1ZMR	13 "
1NC	8 "	1ZRX	13 "

C.w.— VK1LN 288 pts.

Open— VK1DA 377 pts.

NEW SOUTH WALES

(Award Winners in Bold Type)

Phone—

VK2AL	93 pts.	VK2AGF	700 pts.
2CH	111 "	2AIA	237 "
2CM	250 "	2AIC	50 "
2DM	320 "	2AJJ	94 "
2EK	202 "	2AJL	24 "
2FM	710 "	2AMA	49 "
2GJ	220 "	2APQ	528 "
2HQ	509 "	2AQR	11 "
2HZ	9 "	2ASJ	99 "
2IJ	113 "	2ATT	684 "
2MR	253 "	2ATZ	39 "
2MW	320 "	2AUQ	279 "
2OH	569 "	2AVT	51 "
2PF	616 "	2AWN	234 "
2QZ	180 "	2AWX	111 "
2RC	496 "	2AYF	43 "
2RJ	434 "	2BCW	43 "
2RP	86 "	2BGF	574 "
2RU	160 "	2BJF	44 "
2SG	109 "	2BMK	583 "
2SJ	595 "	2BRL	17 "
2TS	499 "	2ZCT	51 "
2VS	5 "	2ZCF	98 "
2WT	223 "	2ZGK	13 "
2XT	663 "	2ZJT	35 "
2YJ	22 "	2ZNK	8 "
2YN	626 "	2ZPC	10 "
2AAT	49 "	2ZSG	17 "
2ACD	263 "	2ZSI	15 "
2ACZ	305 "	2ZTM	6 "
2ADL	40 "	2ZWM	54 "
2AEC	352 "		
2AFD	331 "		

C.w.—

VK2GT	188 pts.	VK2AGI	462 pts.
2BW	30 "	2AGS	39 "
2JM	11 "	2AHM	30 "
2JY	84 "	2AJQ	121 "
2OY	31 "	2ANZ	44 "
2QL	545 "	2AXK	31 "
2VN	997 "	2BSJ	45 "
2YB	120 "		
2ZC	92 "		2533 pts.
2ZO	54 "		

Open—

VK2BO	1697 pts.	VK2AUC	91 pts.
2CK	280 "	2BCO	286 "
2PU	227 "	2BCP	425 "
2RA	47 "	2BST	202 "
2AHA/M	13 "		
2ASJ	96 "		2782 pts.

VICTORIA

(Award Winners in Bold Type)

Phone—

VK3BA	26 pts.	VK3AFW/P	884 pts.
3DY	310 "	3AGM	290 "
3EG	980 "	3AIH	304 "
3EY	189 "	3AGQ	135 "
3HO	1341 "	3AIS	10 "
3NN	133 "	3AJP	17 "
3OM	761 "	3AKJ	300 "
3OR	832 "	3AMK	361 "
3PP	78 "	3AQS	251 "
3RV	667 "	3ARM	70 "
3VK	815 "	3ATN/M	41 "
3VT	72 "	3AUC	82 "
3WM	77 "	3AWV	130 "
3WW	581 "	3AZJ	21 "
3WY	153 "	3ZCQ	11 "
3XU	2086 "	3ZQN	40 "
3YQ	693 "	3ZUE	22 "
3ABP	161 "	3ZVV	66 "
3ADW	953 "		
3AEJ	732 "		12390 pts.

C.w.—

VK3EZ	85 pts.	VK3ADB	461 "
3IB	302 "	3APJ	471 "
3PR	23 "	3ARV	93 "
3QK	272 "	3AXK	670 "
3VP	85 "		
3XY	940 "		3708 pts.
3ABR	149 "		

Open—

VK3DQ	630 pts.	VK3YO	202 pts.
3KC	142 "	3YS	196 "
3OP	635 "	3ABA	107 "
3RS	21 "	3AKS	710 "
3PG	32 "	3APN	542 "
3QV	780 "	3ASL	380 "
3SM	680 "		
3XB	179 "		3236 pts.

QUEENSLAND

(Award Winners in Bold Type)

Phone—

VK4AT	36 pts.	VK4OF	112 pts.
4AV	28 "	4PJ	432 "
4BG	17 "	4PQ	366 "
4BM	67 "	4PX	537 "
4BQ	667 "	4PZ	35 "
4CP	788 "	4QW	139 "
4CZ	144 "	4RL	108 "
4DO	505 "	4RW	37 "
4EH	57 "	4SF	93 "
4EQ	83 "	4UW	31 "
4FA	236 "	4YX	1440 "
4FX	65 "	4WW	1115 "
4HB	265 "	4XI	13 "
4HC	219 "	4XJ	167 "
4HR	196 "	4XY	823 "
4HZ	6 "	4XZ	318 "
4JJ	46 "	4ZZ	14 "
4JM	995 "	4ZDC	6 "
4JW	27 "	4ZMD	Check Log
4LE	227 "		
4LZ	269 "		10656 pts.

C.w.—

VK4KK	27 pts.	VK4XW	318 pts.
4UU	3 "		
4WO	118 "		475 pts.

Open—

VK4FH	225 pts.	VK4UC	183 pts.
4JI	129 "	4UK	415 "
4LT	1013 "		
4RR	1239 "		2306 pts.

SOUTH AUSTRALIA

(Award Winners in Bold Type)

Phone—

VK5AX	513 pts.	VK5OF	21 pts.
5BF	80 "	4OG/5	18 "
5BI	231 "	5ON	67 "
5BQ	905 "	5PM	17 "
5BV	32 "	5QX	905 "
5CA	35 "	5RI	116 "
5CH	83 "	5RL	20 "
5CJ	40 "	5SS	135 "
5DC	83 "	5TJ	428 "
5DE	330 "	5TN	7 "
5DF	31 "	5TY	428 "
5DI	30 "	5UT	43 "
5DO	96 "	5UJ	337 "
5EF	300 "	5WC	134 "
5EJ	268 "	5WG	310 "
5EU	32 "	5WI	17 "
5EV	17 "	5WN	122 "
5FD	20 "	5WO	379 "
5FJ	470 "	5XO	104 "
5FL	302 "	5ZB	1043 "
5FM	349 "	5ZK	350 "
5FQ	245 "	5ZQ	411 "
5GF	332 "	5ZZ/T	613 "
5GM	89 "	5ZBC	21 "
5GW	955 "	5ZCQ	18 "
5GX	693 "	5ZDX	56 "
5HP	107 "	5ZEH	4 "
5HW	19 "	5ZEJ	27 "
5JC	258 "	5ZGF	40 "
5KE	26 "	5ZJW	36 "
5KF	89 "	5ZKB	10 "
5KM	1035 "	5ZKK	38 "
5KN	152 "	5ZLT	27 "
5KS	35 "	5ZMT	6 "
5KX	23 "	5ZMW	43 "
5LC	280 "	5ZNH	53 "
5LQ	45 "	5ZPB	22 "
5MM	10 "	5ZRP	41 "
5MQ	30 "	5ZSJ	19 "
5MS	26 "	5ZSW	33 "
5NJ	194 "	5ZTS	66 "
5NM	309 "	5ZUL	40 "
5NN	843 "	5ZXR	30 "
5NT	33 "		
5NY	1113 "		18167 pts.
5OB	31 "		

C.w.—

VK5AU	128 pts.	VK5LD	148 pts.
5BB	107 "	5MY	340 "
5BZ	94 "	5MZ	43 "
5FO	574 "	5OR	148 "
5FE	573 "	5ST	25 "
5GP	53 "	5TL	100 "
5HO	53 "	5VW	53 "
5JG	28 "		
5JT	101 "		2091 pts.
5KU	18 "		

Open—

VK5CL	50 pts.	VK5RG	895 pts.
5CV	987 "	5RK	30 "
5HM	337 "	5TC	220 "
5LN	687 "	5TM	173 "
5LZ	53 "	5WV	260 "
5NK	73 "		
5QR	225 "		2770 pts.

AMATEUR FREQUENCIES:
ONLY THE STRONG GO ON—
SO SHOULD A LOT MORE AMATEURS!

WESTERN AUSTRALIA

(Award Winners in Bold Type)

Phone—

VK6AV	324 pts.	VK6LV	24 pts.
6BS	21 "	6MP	577 "
6BT	96 "	6MO	157 "
6CA	127 "	6NJ	38 "
6CD	858 "	6NM	345 "
6CF	679 "	6RG	206 "
6CJ	32 "	6RT	62 "
6CR	13 "	6RY	1136 "
6CW	444 "	6SE	16 "
6DA	615 "	6SM	539 "
6DC	22 "	6TU	18 "
6DI	42 "	6TX	142 "
6DR	161 "	6WI	45 "
6DT	197 "	6WL	131 "
6EP	338 "	6WY	574 "
6EZ	49 "	6XW	513 "
6FG	287 "	6XY	796 "
6FX	105 "	6ZBG	30 "
6GB	88 "	6ZCW	19 "
6GH	97 "	6ZDF	25 "
6GL	15 "	6ZFB	33 "
6ID	117 "		
6KH	138 "		10487 pts.
6LQ	70 "		

C.w.—

VK6AJ	81 pts.	VK6WT	435 pts.
6AS	111 "	6WW	127 "
6NK	117 "	6ZO	29 "
6OV	70 "	6ZZ	93 "
6QJ	93 "		
6RP	76 "		1391 pts.
6RS	179 "		

Open—

VK6BE	864 pts.	VK6WU	91 pts.
6HK	61 "	6ZW	113 "
[illegible]	274 "		
[illegible]	348 "		2034 pts.
6VK	176 "		

TASMANIA

(Award Winners in Bold Type)

Phone—

VK7AB	39 pts.	VK7BM	1234 pts.
7AI	39 "	7BS/P	680 "
7BP	9 "	7TX	837 "
7BQ	24 "	7WF	86 "
7BT	13 "	7WI	427 "
7CK	67 "	7XL	311 "
7CT	59 "	7ZAH	10 "
7DJ	252 "	7ZAK	6 "
7DW	17 "	7ZAO	26 "
7EB	190 "	7ZAS	23 "
7FB	231 "	7ZED	20 "
7JD	13 "	7ZJG	26 "
7JO	32 "	7ZKJ	30 "
7LS	176 "	7ZRO	32 "
7MX	162 "	7ZTM	13 "
7PA	237 "		
7RL	209 "		5840 pts.
7SF	270 "		

C.w.—

VK7BJ	42 pts.	VK7MZ	129 pts.
7CH	16 "	7RY	69 "
7JB	163 "	7ST	25 "
7JG	26 "	7VW	53 "
[illegible]	16 "		
7LJ	40 "		878 pts.
[illegible]	346 "		

Open—

VK7AL	919 pts.	VK7OM	116 pts.
7EJ	861 "	7YL	40 "
7KA	12 "	7ZE	849 "
7KC	50 "		
7MR	119 "		2106 pts.

NORTHERN TERRITORY

(Award Winners in Bold Type)

Phone—

VK8AV	694 pts.	VK8DI	393 pts.

C.w.—

VK8HA 160 pts.

Open—

VK8JE	47 pts.	VK8UG	939 pts.
8KK	1341 "		

PAPUA, NEW GUINEA AND TERRITORIES

(Award Winners in Bold Type)

Phone—

VK9BK	788 pts.	VK9AG	780 "
9DJ	1711 "		

C.w.—

Nil Entry

Open—

VK9AG	780 pts.	VK9YB	398 pts.
9DR	257 "	9XI	541 "

ANTARCTICA

(Award Winners in Bold Type)

Phone—

VK0CB	2078 pts.	VK0CS	96 pts.

RECEIVING SECTION

(Award Winners in Bold Type)

New South Wales

D. Brady	365 pts.
P. Whenman	171 "
B. Mitchell	144 "
S. L'Brien	201 "
WIA-L2022	613 "
WIA-L21033	286 "
WIA-L3074	431 "
WIA-L3173	1383 "
WIA-L3244	912 "

Victoria

I. Drysdale	963 pts.
P. Forbes	1042 "
P. Mill	132 "
G. Pearce	78 "
WIA-L3042	225 "
WIA-L3055	300 "
WIA-L3213	358 "
WIA-L3288	875 "
WIA-L3303	150 "
WIA-L3308	329 "
WIA-L3317	188 "
WIA-L3333	1043 "
WIA-L3335	579 "
WIA-L3343	871 "
WIA-L3344	346 "
WIA-L6021/VK3	1350 "

Queensland

WIA-L4154	147 pts.
WIA-L4158	223 "
WIA-L4182	140 "
WIA-L4346	536 "
WIA-L4207	115 "

South Australia

R. Edmeades	11 pts.
J. Ross	6 "
WIA-L5065	439 "
WIA-L5078	1049 "
WIA-L5080	338 "
WIA-L5086	181 "

Western Australia

A. Bell	387 pts.
J. Bergin	807 "
WIA-L6003	353 "
WIA-L6043	807 "

Tasmania

R. Verral	884 pts.
WIA-L7021	1113 "
WIA-L7026	333 "
WIA-L7043	813 "

DX

Sub-Editor ALAN SHAWSMITH, VK4SS
35 Whynot St., West End, Brisbane, Qld., 4101

Ionos, the DXers God of Communication, seems to be in benevolent mood. Never for years has 14 and 21 Mc. been so good. Even 28 Mc is beginning to become expansive. The next twelve months or so might see this peak out, so make time and be in it while it is offering.

NOTES AND NEWS

South Orkney Is.: VP8JD 14060 1900z. Also reported on 14127 a.m.

Falkland Is.: VP8JC 21323 1930z. Also on 3715 2130z.

South Georgia VP8IE 14120 1830z. QSL to W3GHK

W Pakistan Several AP prefixes now seem to be appearing. Some are: AP8HQ 14005 1800z AP2MR 14145 1500z. AP2AD 14108 1800z. QSLs for the latter go via P.O.B. 94, Lyallpur.

Crozet Is. FB8WW 14040 1900z. Also 14340 s.s.b. 1300z. QSL K5AWR.

Glorieuses Is. FR7ZC/G 14135 1500z and later Guernsey GC8HT 14133 1400z. Uses other bands and frequencies.

Outer Hebrides GM3LHZ/P 21355 1216z. Also 3730 2100z.

Bonaire: Commencing Dec., K0GZN hopes to be active for three months.

Trinidade: PY0TX 14110 1900z. PY0AMF 14112 2040z. PY0CZR 14145 2000z.

Turkey: TA1SK 14011 1700z. TA2GK 14040 2300z. TA2FM 14060 2300z. TA4EK 14165 1900z.

Ceylon. 4S7FB 14170 1300z. QSL K6CAZ.

St. Peter and Paul Rocks PY7AOA, PY7AKW and PY7ACQ plan to operate from here for period Dec 4-16. Their s.s.b. call will be PY0SP and on c.w. it will be PY8DX. 14105, 21300, 14000

Scott Base Remember Ian ZL1ABZ. He will be ZL8AA for a year commencing now. (ZL-2GX)

Galapagos: HC8JG is said to be active on 14160 around 0400z

Saudi Arabia. 7Z3AB 14183 listening 14210. QSL W4HEG

Wrangel Is., DX-pedition is planned for this one around Xmas '67 Operators will be UB-5UN, UW3CS, UA3FT. The call sign will have the prefix 4L0 or 4J0.

Aldabra VQ8JW/A is reported QRT with p.s. trouble. Should be on 14 s.s.b. again by the time you receive this.

Tromelin: FR7ZL/T will commence from here around Sept. 17 for a prolonged period of operation

Reunion: FR7ZD 14185 and listens 14205 around 0300z.

Lebanon: OD5BZ 14210 0400z.

San Marino M1B 14200 0500z.

Zambia: 9J2AB 14245 0500z. QSL W6RZH Goes by name of Buggy

Amsterdam Is.: FB8ZZ 14045 0600z.

Montserrat VP2MJ 14220 1600z.

Canary Is.: EA8FO 14005 0030z. Others active on 21 and 28 Mc

Comoro Is., FH8CD 14167 1410. On almost daily

Grenada VP2GAR 21340 2000z. QSL P.O.B. 201, St. George

Sao Thome CR5CA 21063 2300z.

Volta Rumour has it that all operations have been suspended from here.

Hong Kong VS6FX 21030 1000z, and VS6CO 14267 1340z. VS6FZ 28500 0900z.

St. Marten: PJ2MI 14192 listens 14202. QSL VE3EEU

Yasme DX-pedition.—Currently Lloyd and Iris are using the call 5L2KG. However, they are about to move from Monrovia and hope to make their next stop either TU2 or EA9. Keep an ear to these freq.: 7010, 7090, 14051, 14199, 21051, 28580. All QSLs go to P.O.B. 2025, Castro Valley Calif. U.S.A.

Muscat MP4MAX 14108 1800. Has a big signal here.

Pitcairn: W3DWG/VR6 is doing a six months' stint from here. Preferred freq. is 21350 s.s.b.

Andorra PX1HV 14043 1405G QSL WA5HJM. Several PX stations are reported active

Fletchers Ice Is.: This is a 10 x 6 mile slab of drifting ice in the Arctic Ocean. WA1ARF/KL7 is active 14 s.s.b. and c.w

Lesotho 7P8AR, ex ZS8L, around 21350 from 1000z.

Cyprus ZC4MO active daily 21300, 2000-2200z. QSL WB2ZMK.

Honduras: HR6VH active daily 21 s.s.b. QSL to WA5IQP.

Spanish Guinea: EA9QQ. Watch 14095, 103 and 110. QSL via W4DQS.

Luxembourg DJ2IB/LX, 14015, 210, 21015 between 1900-2200z. DJ8JK/LX 14215 around 2300z. QSLs via DJ2IW.

Finland: To commemorate Finland"s 50th year of Independence, prefixes of OF will be used during October to December

Bulgaria LZ0CRC 14205 1430. Rarer for W.P.X.

Gibraltar: ZB2BD 21340 s.s.b. 1630. QSL to G3TTG home QTH. ZB2HE QSLs to EI6TA home QTH.

Kuwait: 9K2AM 21346 1250, 9K2BY 14120 1830z.

Thailand: HS1HC 14105 1530. QSL P.O.B. 2068, Bangkok.

Faeroes OY7ML 28 Mc. Both modes. Several other OY stations active on other bands.

Laos XW8AX 14110, 1200z. QSL W6KTE.

Willis Is.: John VK4HG having a few minor troubles. On the last air drop his 10 and 15 mx gear went into the drink beyond the reef So look for John now only on 20 s.s.b. 0600 and 2000z.

LATE NEWS

Aldabra: In a QSO with John VQ8JW on 7065 at 1930z, he passed the following info: Active on all bands L.S to 28 Mc. 160 and 80 mx will be used as much as possible commencing middle Oct. He will be on the island till late March or early April 1968. He works s.s.b./c.w. Mostly comes on daily around 1600z and continues through. He will come up on skeds on any band. Look for him on these freq.: 7007, 7040, 14080, 14110, 14140, 21040, 21400, 28040, 28600. QSL G3ONU.

ACTIVITIES

Bert VK5BB seems to have been busy on both 20 and 15 mx. He reports making W.A.S. twice over on the latter band since Feb. '67 QSOs on 20 were UB5NO OZ6KG UC2BF. TI2CAP, I1YV DJ5WU, GC2FKW. 7X0AH, CT1LN, SP8AJK VK4HG FK8AU CR7PV, 4X4CJ, FG7XL, UT5LE, YU1YG On 15 mx: ZS6BLK VK9XI (Xmas), F3WB. OA4JL, 9J2IE, 5N2AAW, KJ6BZ, KZ5MP. TG9GF, W3DWG/VR6, CN8FV, VS6MB, IT1TAI, YV1TP, KM6CE, 7Q7LZ, etc. (Nice work OM.—AL)

Dud VK4MY now mostly on 14 s.s.b. and reports the band as good. He landed these: VQ8CA 14130, ZD7DI 14115, 9M6MW 14230, W3DWG/VR6 14105, VO1FB 14165, VE1IE, HR-1JMF, VO1BD, VE1KG all on 14170, W2NTJ/VE3 14150, HL9TM 14110, PJ2MI 14150 5L2I 14135, LX1WR 14125. VS6CO 14130. VQ8CBB 14195. HS1RZ 14190 6Y5MJ 14118. VS6MB 14100, DM2CZL 14110 YU1BCD 14170, 5U7AL 14170, AP2MR 14160, UB5KMX, 8R1E, VE2MB, ZS6XM all on 14160. FP8DC 14190 FP8BD 14190, VO1FY 14180, 9Y4AR 14140. CO2FA/CO4 14100, 4U1ITU 14180. VP1RC 14168, UQ2KPG 14160, UW1KAT 14122. 9Y4DS 14110. 3B1EI 14170 and many more. Space does not permit. (A big beg, OM. Keep it up.)

Peter VK4PJ also reports a big improvement on 20 mx and 15 and ten mx to a lesser degree The following are just a few of the nice ones QSOed. 14 s.s.b.: 9M2PO, SM5BB, YO3LM, 11LCK, HK3YO, UQ2LL, SP8AJK, CT1BH, VU2SV IS1RUA, HB9RB, LA2BK, 5M2BHX, UQ2KGF PX1PA, AP2MR KP4BLI, KP4BS, OH5OS, EA8GF, TL8DL, ET3REL, TF3MA YU-4ALM VP8JC YU3HDE, HS1RZ/3. CE8CA, 9H1M CT1SZ plus many Gs and DLs, etc. Mostly 14100-150 2000z. 15 mx SM3RQ, G3NLV, GM3SVK G3LBG, G3NEZ, OK1ADM OZ4FA, OE9PX, DL6PC G8UR, XW8BQ, DL3CX, SM-6CKU G14RY, LA5KG, DL7AA, OZ3GC, SM-3WB. DL0EV SM7DQK OA2AM, F3YT, and many more Europeans. QTR 1000-1200z. Ten metres DJ1QI, SM3RQ, G3FPO, F8II, F3YT, G3TA, G5TP, etc 0900z.

Dave VK3QV, who writes from Manilla, P.I., sends this list worked on 10 mx before he left for overseas on business. G3JOC, KR6HY, KR6QW, KR6TAB, KW6EO, OH2TI, OH3NY, VE7BOB, VS6FS, VS6PZ, YA1AB, ZS9AJK, plus all W areas. Dave reports the band coming to life day by day.

Chas. VK4UC, a 60w QRPer, reports he is now W.A.Z., W.P.X. and W.A.S. Says 14 Mc. has been very good and managed 14 new prefixes for the month. Some worked are G3RJH, KS6HQI, KR6UD. DL1IB, VK8XI, 4U1ITU, CT-1CB, DM3SBM, DL2KM. DL8KO, DL4PM, DL-6VP PaTQ P9OB, EA8FJ, EA8CG, GW3REQ, GW5BI GW6YQ HA0LC, HB9FE. HM2CM, IT1AQ, I8BOH (QSL I1BBC), LA4CI, LU8DLK, OE7AZ, OE2PWW, PA0PFW, SP6KBE. VE8DG, VP8AM, VS6MB, YO3RX, YU0J, UA8JV, UA-1KAE (Mirny) KC4USB (between 0530-0630z).

Al VK5EK says: "Just a quick note to let you know that 28 Mc. is in fair shape." All on 28,625 Kc. s.s.b. Gear is 150w. p.e.p., 4 el. mono-bander: VQ8CG 0735, VS6FZ 0656, UA-3TU 0907, SM5WJ 0925, HB9ZC 0935, DL1CB 0940, SM7BKH 0950, GM3SVK 0907, G3LSF 0913, UF6ACR 0923, UV3AAE 1005, UW3GU 1012, PA0FM 1024, XE1CCW 0008 9J2DT 0628, ZS6HD 0544, ZS9H 0708, OE3SGA 0940, HG-2KRD 1006, DJ9VW 1020, Ws and Gs. (Welcome to the column, Al, some more please, deadline is end of each month.)

Barry VK5BS QRP 14 Mc, lists these: VP8YF, VE3DG, UV3BC/M Antarctica, DJ2IB/LX, XE1LL (Box 701, Vera Cruz) All on 14 c.w Barry reports QRP membership coming along only slowly. Write Oceania Co-ordinator, 18 Cornish St., Glenelg North, if you wish to join

Ken VK3TL worked on 20 mx: CE3AA 1206z, CE0PC 0858 (Easter Is.), CR7FM 1215, EA8CG c.w 0640, VP2GAI 0838, VK4HG 1150 (Willis Is.), VQ8CBB 1255, VQ8CCR 1300, YJ8BW 1100, 5L2KG c.w 0745, 7X0WW c.w 0803. All times GMT Best QSLs received: ET2AC, CM2WB, 11AUM/M1, I8KDB, FY4BEK, ZD7DI.

SOME QTHs

5N2AAW—Via K8OQO.
TG9GF—Box 762, Guat. City.
7Q7LZ—Via G3LZZ.
8J2IE—Via W2CTN
OA4JL—Box 538, Lima, Peru.
HL9TM C/o American Embassy, Seoul.
HS1RZ P.O.B. 2068, Bangkok, Thailand.
VS6MB—QSL W3CTN.
8R1S P.O.B. 739, Georgetown.
FP8DC—QSL to VE3CQD.
5L2KG—Yasme.
CE0PC—Via DL9KRA.
YJ8BW—Via W4NJF.

AWARDS

Latin America DX Award: Working 75 different prefixes (CE1, CE2, etc.) in Latin America countries CE, CO, CP, HC, HH, HI, HK, HP, HR, LU, OA, PY, TG, TI, XE, YN, YS, YV, ZP from Jan. 1, 1960. Single band or mixed. Send $1 or 8 I.R.C's to Dr. J. Lorens, LU9DM, Lujan 1798, Lanus, F.C. Roca, Argentina. Also available to S.w.l's. (By courtesy of Geoff Watts, DX News-sheet.)

SUMMARY

New sheets and Bulletins are beginning to read like a DXers "Who's Who" With all bands open and working the list of QRV "goodies" is ever increasing. One must be satisfied with a percentage worked. For myself, I find it gratifying to now be working a lot of the OT DXers on 15 and 10. Chaps previously active on 7 and 14 Mc. Thus making four and occasionally five band QSOs.

DX News exchanged with Overseas Bulletins: LIDXA, FLA' DXer, "Air Waves" and with Ed's ZL1AFZ, Rod McNicoll VE2FXR, Geoff Watts. My thanks as always to the column's supporters. 73, Al, VK4SS/I A.R.J S.

W.I.A. D.X.C.C.

Listed below are the highest twelve members in each section. Position in the list is determined by the first number shown The first number represents the participant's total countries less any credits given for deleted countries. The second number shown represents the total D.X.C.C. credits given, including deleted countries. Where totals are the same, listings will be alphabetical by call sign.

Credits for new members and those whose totals have been amended are also shown.

PHONE

VK3MS	317/330	VK4HR	280/306
VK3AHO	314/326	VK4FJ	279/296
VK5RU	304/327	VK3TL	261/266
VK5MK	303/320	VK4TY	251/253
VK5AB	300/314	VK1AAK	246/250
VK1IZ	291/306	VK1APK	234/237

C.W.

VK2QL	295/315	VK3NC	286/286
VK2ADE	291/313	VK3ARX	283/271
VK3CX	291/313	VK5HR	263/285
VK4FJ	291/313	VK5RU	263/283
VK3AHG	290/302	VK3TL	251/254
VK3AGH	282/295	VK3YL	251/268

OPEN

VK2AGH	311/329	VK2EQ	295/316
VK5RU	308/331	VK4FJ	295/315
VK2ADE	305/329	VK4TY	291/303
VK5MK	305/328	VK3ARX	281/289
VK4HR	303/324	VK3TL	281/285
VK2VN	300/315	VK2ACX	276/300

SWL

Sub-Editor: D. GRANTLEY, WIA-L2022
P.O. Box 222, Penrith, N.S.W., 2750

Very few of us bother to listen on 1.8 Mc. as activity is more or less non-existant, however this is not the case in other parts of the world. This month I have asked our prominent VK6 S.w.l., who hails from England, to tell us something about the band in that country. Over now to George Allen, L3042.

This band is allocated to stations in the Amateur Service on a secondary basis on condition that they shall not cause any interference to other services. The frequency allocation is from 1.8 to 2 Mc., with a maximum d.c. power input of 10 watts. The secondary services are mainly coastal stations operated by the Post Office and give a R/T service to coast-wise shipping. There are some continental services of the same nature, some of which operate almost around the clock, and on the whole the shared operation has worked quite well. Occasionally Hams have been politely told to QSY.

Although top band (as it is known in Europe) has always been popular, particularly for short rag-chewing on phone, it has great DX potentialities over a dark path, a fact of which many regular users were unaware a few years ago. Much Ham history was made in that part of the spectrum as the record books show.

Its present popularity owes much to the genius of the late G6QB, whose journalistic prowess was world-famous, and who thought up the "counties" plan. This competition caught the imagination, and there was soon a great rivalry to top the counties ladder, not only among the tx men, but also in the ranks of the s.w.l. fraternity. Even now, years after its inception, county-chasing is a popular top band activity, and DX-peditions to "rare" counties have been known to cause as big a pile-up on this band, as on the higher frequencies. G3IGW, one of the stalwarts on 160 mx, has made many trips to remote parts of Scotland to give other Amateurs the chance to work difficult counties.

Another big factor in developing the DX side of the band, stemmed from the activities of Stew Perry, W1BB, whose exploits in that band are world famous. His flair for organising the American side of the Pond, and inaugurating regular tests during the winter months, which are now a regular feature each year, has resulted in inter-continental DX working on a scale scarcely thought possible on such a low frequency. Other organised contests, world-wide in scope, have been instrumental in producing results which, on many occasions, have rivalled the DX produced on 14 Mc., and there are several Amateurs who can claim to have W.A.C. on 1800 mx. W1BB is nearing his century on the band, a feat which is bordering on fantastic.

Most of the DX is to be found from 1.8 to 1.830 Mc., but in that slice, at least three powerful coastal stations make things rather hectic at times. As far as possible that segment is left for the DX to work in, the Gs and other Europeans keeping above 1.830, though due to over-eagerness, the DX portion sometimes gets cluttered up, with near chaotic results. The high end, when conditions allow, often produces some of the choicer tit-bits, such as W0, W6, W7, also Central and South America.

Whatever is happening on the band, the first flush of dawn warns operators that the end is nigh, and about an hour, sometimes more, after that, following the characteristic pre-fade-out boost, suddenly the DX is gone. It is quite an experience hearing, say, VP8 in broad daylight during this last critical period.

This short summary would not be complete without mention of the two top-band contests which are an annual and eagerly awaited event for which the R.S.G.B. is responsible. These always produce hard fought battles, in which some of the best operators in G participate, and the standard of operating is very high indeed, an object lesson in the art of c.w. operation.

Many Hams have kept late hours on the band, or have crawled out of warm beds at 0600z on a winter morning to see how far their 10 watts would get, maybe from an aerial held up a couple of hundred feet by a gas filled balloon, but very few would consider the effort wasted.

TAPE CORRESPONDENCE

Due to the nature of magnetic tapes and spools, much care must be exercised when mailing them, particularly to overseas addresses. Since tape recorders have been available at more reasonable prices, many international s.w.l's use this means of communication, in fact there are some who prefer it to two-way radio communication. Be that as it may, care must be taken in mailing these articles, to ensure not only their safe arrival, but their safe arrival by correct mailing procedures. Firstly, in this country, tape correspondence is considered to be a letter, and must be mailed at surface rate and full letter rate. In order to ensure that this is done, a sticker marked LETTER can be obtained from any Post Office. In the case of overseas tapes, a green customs sticker must be attached and filled in where it says "Full description of contents," mark it "recorded letter," and where requests the value, mark it NCV (no commercial value).

This will comply with our regulations, however there is one major problem to be overcome, and it is the point of this note. In some countries, particularly the United States, packets are x-rayed to check their contents and I am sure we all know what would happen to a spool of tape thus treated. So on the bottom of the address side, mark it "**Magnetic Tape, do not x-ray**" and you should ensure the safe arrival of your tape at its overseas QTH.

DX NOTES

VP2LA from St. Lucia on s.s.b. around midnight local time. MP4MAX is Box 36, Muscat, Oman, Arabia. VQ8CC, Box 14, Curepipe, Mauritius. I have the complete list of W1CTN's "clients" and these will appear in the next few issues as there are over 100 of them. TJ1AG, Box 20, Bafoussam, Cameroon Rep. Full marks to TG9AD for specially printed cards which he reserves for s.w.l's. His address is Roberto W. Engel, Box 514, Guatamela, C.A.

AROUND THE SHACKS

Firstly, George L3042 reports the following on 80 mx in the wee small hours: UA1DV, KBB, KBR, KFA, KFC; UA3s AV, DB, DV, TV, UA4s AW, NB, YY; UA6KOB, UB5KAS/IB and QA, UC2KBC/KSB, UP2AY, UP2KBA, UQ2CC UR2AA, AY and KAA, with UW1KAD and UW2KAT for good measure. These were all logged in the Russian contest which was held on the R.D. week-end.

Alan Raftery, who has been and remains busy with studies, found time to knock up a presentable log in the R.D. His only new country is 9L1KG, a Yasme DX-pedition.

I have here the QSL arrangements for s.w.l. reports to future Don Miller DX-peditions, all these must go to VE3GCO, showing date, time in GMT, 3 (at least) QSOs in order, frequency, and mode. Please enclose s.a.e. plus I.R.C. for each QSL sent, in other words each envelope mailed must contain one each QSL s.a.e. and I.R.C. W4ECI still handles QSL chores for Mr. Miller's past jaunts, but the current and future ones will be handled as above, with QSLs for all Amateurs being handled by the XYL of his co-operator, WA5BSO. (Tnx to Monitor.)

From Peter Drew, on National Service at Balcombe in Vic., I have a long list of calls heard. 20 mx s.s.b. produces FF8CA, CT3AO, CE0PC, 9G1DI, PJ2AQ, VQ9TC, AP2MR, 7Q7EC, 5Y5MJ; 20 mx c.w.: ZL5AC, UL7JA, HL9KJ, 9M6II, 9V1OG; 80 mx s.s.b., KL7DTH; 40 mx s.s.b.: KH6s, FK8AU, EA3JE, DU1FH; 40 mx c.w. GI3AQR, YO7EL, 15 mx s.s.b.: KH6, JA, W, 5W1AS, KA9MF, JH1BFF, FO-8BL, VS6FS, 15 mx c.w. FB8YY, HM1BW, and finally on 10 mx s.s.b. KX6DC, KR6QW, ZL and W. Thanks, Peter, also for a very welcome list of QTHs for the little black book.

VK3 DIVISIONAL NEWS

The only official news I have is in the form of a letter which I received from the President of the Group telling me that in view of the fact that they are streamlining the Group, my services as QSL Officer are no longer required, and that the Secretary will in future be handling these chores, and it is proposed to ask members to contribute an additional 50c in order that they may have their cards mailed.

I immediately contacted both the Secretary and President, but to date, which is three weeks later, I have had no reply. Ethics would prevent me from making any comment here, however let me assure any chaps that any cards received by me from overseas will be mailed direct to the persons concerned, and this applies in particular to those addressed to non-members of the W.I.A.

I am taking up the question of handling of VK3 S.w.l. cards for members and non-members with the N.S.W. Divisional Council, and I hope that we can have this tangle straightened out.

VK3 DIVISION

The VK3 S.w.l. Group reminds everyone of their meetings and any persons interested in radio, specially members of the Youth Radio Scheme, are most welcome. You are reminded that there is a constructional night on the second Friday of each month as well as the regular meeting on the last Friday of each month. The s.w.l. newsletter "Zero Beat" is issued six times a year, and is attempting to cater for all tastes in Short Wave Listening. Subscription is 60 cents per annum posted, and can be obtained by contacting the Editor, "Zero Beat," Box 52, Caulfield South, Vic.

That's it for now chaps, our next contest is the S.w.l. Section of the Ross Hull, and hope we can have a good roll-up. 73, Don L3022.

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Publications Committee Reports

No reports have been published for the last two months due to the fact that meetings have not been held until the middle of the month, by which time "A.R." has been on the press. As all correspondence and articles have been individually acknowledged, they will not be included in this report.

At the October meeting, correspondence was received from VK7ZCP commenting on a recently published article. As the author is at present overseas, we are withholding the letter to give the author time to comment. Technical articles were received from VK2AC and VK2ASL.

Discussion for the night centred round the extra space being given to Federal matters, and what steps should be taken to impose restrictions on other matter in order to leave adequate space for technical material.

Consideration was given to the possible effect of the increase in postal charges on the finances of the committee. It was agreed that while our costs are going to increase, we should wait for a period of three months before making a final decision. It is considered that a regular reduction in the number of pages in "A.R." is the least desirable step, especially after our efforts this year to maintain minimum 88-page issues.

The 1967-68 issue of the Call Book was despatched to all States on 5th October. A new section on Radio Clubs has been incorporated and any club that has been omitted is invited to send details for inclusion in the next issue. The present issue includes all amendments, additions and deletions advised by the P.M.G's Department up to the end of May. Preliminary work has already started on the 1968-69 edition as a complete reset will be needed due to the ruling from the Department that Postcode Numbers are to be included.

All correspondents and sub-editors are reminded that copy for the January issue is due on the 1st of December. Under no circumstances will late copy be accepted. They are further reminded that no Divisional Notes will be published in the February issue.

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Correspondence

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the Publishers.

ZB2AM QSLs

Editor "A.R.," Dear Sir,

I have been asked by Mike Matthews, G3JFF, to "advertise" the fact that during his recent Gibraltar activity (two years), he made 10,871 contacts and these included a lot of VKs (via long path mostly). He believes that some VKs have not received his ZB2AM QSL card and suggests that a request for it to his QSL manager, Ralph W1HGT, will bring the desired result. Mike hopes to have another "exotic" call sign soon (possibly in Far East area)—in any case he hopes to visit VK/ZL before long and have "eyeball" contacts with his many friends out this way. Mike advises that the future Ham activity from ZB2 isn't very bright, especially for DXers.

—Eric Trebilcock, WIA-L3042.

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GHASTLY?

It has been said that to stay on c.w. is ghastly! Perhaps it was a joke, but it is the most useful method of communication between people who do not speak one another's language too well. Also, in times of war.

What could be more suitable. Morse Code has a musical rhythm, and when conditions are at their worst, the c.w. stations still have their QSOs.

(Diana Green, ZB8GH, writing in "YL Beam," April, 1967.)

VHF

Sub-Editor: CYRIL MAUDE, VK3ZCK
2 Clarendon St., Avondale Heights, Vic., 3034

Well judging from the Interstate correspondents, activity on the v.h.f. bands is at a low level, but if things are to form, activity should increase with a rush over the next month or so. I would like to bring to your attention the lead article in the Federal news of October "A.R."

It would be appreciated if Interstate correspondents could type their copy on half a quarto page, leaving a one-inch wide margin on each side, and post it so as to reach me by the fourth Friday of the month. Some copy for this month's issue arrived at the end of the first week in October. 73, Cyril VK3ZCK.

NEW SOUTH WALES

The last meeting of the V.h.f. and T.v. Group was entertained by a Brains Trust. Thank you to the brave lads who fronted up on the rostrum to face an inquisitive audience. Gentle prompting by Vice-Chairman, 3ZTM, produced several questions and interesting answers.

During the past month another 2 mx day event was held and voted a great success. As results of this event have not been passed to your scribe, I am unable to give further details. The swing to v.h.f. day events is proving quite popular as it allows the family to join in the fun.

The New Year's Field Day is drawing closer and the following is a resume of the rules for this contest. The contest will run over three days, 30th Dec., 31st Dec. and 1st Jan. The event will be split into five periods of four-hour duration: (a) 1700 to 2100 on 30/12/67; (b) 0800 to 0900 on 31/12/67; (c) 1100 to 1300 on 31/12/67; (d) 1700 to 2100 on 31/12/67; and (e) 0500 to 0900 on 1/1/68. The bands in use will be 2 mx and above. A further division will be made of two sections, one for tuneable equipment and one for net equipment. Logs can be submitted for either tuneable section, net section, or both. If you submit logs for both, the contacts must have been made in the same period.

Logs should be submitted for all periods worked, but points can only be claimed for one period. One hour must have elapsed before stations can be re-worked on the same band in the same section. Contacts can be pre-arranged by any method. Contacts via artificial satellites, repeaters, moonbounce, etc., are not permissible. Multiple operators are permissible but only one call sign may be used from each station. Numbers will be the usual readability, signal strength followed by three figures. Scoring distances will be evaluated from military survey maps or similar. The scoring has been derived from a graph which gives one point for contacts up to 62 miles, then the graph rises linearly until there are twenty points for 300 miles. A further increase gives 25 points for a distance of 500 miles and remains a constant 25 points for all distances over 500 miles.

My apologies for any error in this resume as the contest committee failed to supply this information for retransmission and it was necessary to cull the information from the Sunday evening broadcast. All modes may be used in the contest and your presence during the contest would be most welcome.

During September a 6 mx opening to JA occurred but no N.S.W. station is known to have a two-way contact although it is understood that VK2KK revelled in numerous contacts. Of note was the large number of JA stations using s.s.b. There is no doubt about this mode for DX operation and it will pay to be equipped to receive s.s.b. if not to transmit this mode. 73, Keith VK2ZAU.

Hunter Branch.—52 Mc.: The band has been quiet. Channel 0 has been heard at times, but no DX so far. New stations that should be heard from the Hunter Branch this DX season are Frank 2ZFX, Gordon 2ZSG and Dick 2ZSL. Maybe a few others will show up on 52 Mc as the DX season gets into swing. 144 Mc.: This band has been quiet most nights. Monday nights have been rather active, probably to hear our local broadcast being transmitted on 3.5 Mc. and relayed on 144.443 Mc. a.m. and 146 Mc. f.m. 73, Mac 2ZMO.

VICTORIA

Most of the v.h.f. activity in Melbourne over the past month has been on the 6 mx a.m. net on 53.032 Mc., and judging by the large number of orders for the V.h.f. Group's 6 mx converter with its better than 3 db. noise figure, gain in excess of 30 db. and excellent cross modulation resistance it looks as if it could become the most active band this summer. With this in mind, I would like to remind the DX hounds in other States that we can hear you but are you equipped to hear us? Powers used in Melbourne vary from 100mW. to 150w. using a.m., s.s.b., f.m. and even some c.w., with vertica. polarisation.

V.h.f. Group Convention.—The V h.f. Group's 4th Annual Convention was held over the week-end of 7th and 8th October at Geelong. Over 70 Amateurs and S.w.l's registered and with their families and friends the number present rose to over 200. Everybody appeared to have enjoyed the week-end of activities. Many thanks to Bob 3IC for looking after and arranging the games, to the Geelong Amateur Radio Television Club, and the members of the VK3 V.h.f. Group who organised the week-end. Well that's all for now, until next month, 73, Cyril 3ZCK.

P.S. VK4 Amateurs look for me on 52.05 Mc. a.m. P.P.S.—Please accept my apologies for the severe cutting of the V.h.f. Notes last month, but there was not enough room for PanSy.

Eastern Zone.—During August and September there was no DX recorded, for the bands 52 Mc. and above. (The m.u.f. is still climbing, each 28-day cycle becoming more interesting.) Trevor 3ZGA, Newborough, and Les 3ZSS, Moe, are looking for Melbourne contacts. Both are using a frequency of 144.123 Mc. a.m. Peter 3ZDP in Sale is now v.f.o. on 2 mx s.s.b. 73, George 3ZCG.

QUEENSLAND

These notes arrived too late for the October issue and are being included as Nov notes have not been received. By now with the spring here, activity on all bands should be on the increase, but this year, summer activity may be lower than in previous years. This seems due to a general apathy here in Brisbane and no one really knows why. Anyway, let's hope that the DX period brings back a few regulars on the bands. The VK4 beacon is under construction. Major parts have arrived in Brisbane and regular discussion and construction groups are being held. Several donations of both parts and monies have been offered and these are greatly appreciated. The only major difference between the VK4 beacon and other beacons will probably be the fully transistorised monitor system modified from a D.C.A. design by Alan 4ZLM. The remainder of the system will be standard design with full protection. As regulation has it, the carrier and modulation must be keyed simultaneously, and so a modified system of driver screen modulation will probably be used to simplify keying.

As you have probably guessed, the project is still in the design period at the time of writing and further details will be published when such come to hand.

Winter DX into Brisbane was practically non-existent to my knowledge, but the usual t.v. DX showed up. JA openings were few and far between and evidently the band opened several times from Townsville to Japan in July, but nothing was heard in Brisbane. It is interesting to note that some of the Townsville boys are doing research into trans-equatorial propagation. How about an article in "A.R." Peter?

Alan 4AI is building a high power 6 mx rig for the DX season this year. George 4ZIO should also be on high power soon with a 6/40. Alan 4ZAW is progressing with his s.s.b. exciter, while Rex 4ZRP has given up the idea to be content with mobiling. 73, Mike 4ZMW.

WESTERN AUSTRALIA

With the warming up of the weather, activity is increasing, the 6 mx a.m. channel is so full of stations that the rest of the band seems empty by comparison, although it comes into its own on Sundays. The "Old Timers' Club" continues with its twice-a-day sessions. Some beams have already been scanning the skies towards distant places and it's rumoured that Japan has been heard around the 50 Mc mark. So far I have heard no reports of contacts with the Eastern States. Don't forget to try for South Africa. We know stations are looking for contacts with us. They are transmitting s.s.b. and a.m. around 50.1 Mc. and s.s.b. around 144.1 Mc. at 1530 GMT (0130 E.A.S.T., 2330 W.A.S.T.)

Wolf 6ZAY is back in Australia from West Irian. We are hoping to hear Rod 5ZSD (ex-6ZDS) soon. Jack 6ZBB is building crossed dipoles, hoping one day to hear Australia—if its still possible when some of the new high voltage transmission lines near his QTH come into operation. This looks to be an increasing problem in Perth. (And in Melbourne.—Sub-Editor.) 73, Laurie 6ZEA.

TASMANIA

2 Mx: Activity is on the increase as the warmer weather approaches. Mike 7ZMC has re-built his 2 mx tx to eliminate a few "birdies", so we can now expect a much better signal from the QTH of 7ZMC. For those on the mainland who don't know, there is a beacon operating on the northern coast of Tasmania at Don Heads, near Devonport. The operating frequency is 144.9 Mc. There are approximately six 2 mx f.m. units operating on the north-west coast using Channel A only, as far as I know, but I hope to find out more information on this matter in the near future. If any of these guys would like to forward me information regarding this matter, drop me a line to: Brian Yeoman, VK7ZBR/P/VK7, Flat 6, 7 St. George's Square, Launceston, Tas., 7250.

6 Mx. Activity on this band has taken a turn for the best over the last month. The warmer weather has enticed the would-be Hams away from the one-eyed monster and into the shack. Most of the activity is on the 6 mx a.m. net frequency of 53.035 Mc., but some stations have been heard operating away from this frequency. A new station heard on this band is 7ZLR, but at the time of compiling these notes I did not have any information on his name, QTH or equipment. If he so desires, he can contact me at the above address with this information. Jim 7JO has become active at last on this band, so we hope to hear more from you in the near future, Jim.

On Sunday, 24th Sept., there was an ardent group of Amateurs who were aeronautical mobile over Flinders Island. They were Bevan 7ZBW, Peter 7ZPD, Mike 7ZMH, Trevor 7ZLX and Norm 7ZRC (the latter was also the pilot). They managed to contact a few stations up the northern coast, but did not make it to Melbourne (hard luck!). 73, Brian 7ZBR/7.

EDITORIAL COMMENT

Under normal circumstances, Mr. Maude's P.P.S. would have been deleted from his notes. However in order to set the record straight, the amount of space taken by PanSy has nothing to do with the cutting of the v.h.f. notes. The fact of the matter is that copy date is the fifth of the month as Mr. Maude well knows. His notes for this issue reached me on 10th Oct., which is about the average delay with v.h.f. notes. By this time the composition of "A.R." is fairly well decided, and late material has to take "pot-luck".

Whilst it is possible that the Postal Department is to blame for much of the delay, it surely is possible for Interstate correspondents to send their material off a few days earlier. Mr Maude has reported VK3 activities for 7th and 8th October (i.e. after copy date), so must admit to being late with his own contribution.—Editor.

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YOUTH RADIO SCHEME

We are fast approaching examination time which inevitably means a temporary lull in Y.R.S. activities, but first things first. However, it won't be long before the swing is back to radio and the talk of aerials and gear. It will be interesting to hear how many school leavers have chosen electronics as a career as a result of their contact with Y.R.S. It is general knowledge now that employers favour boys with Y.R.S. certificates.

All those who receive Coyrura, the journal of the Y.R.S. Correspondence Section, will be interested in the new series of vocational guidance information. The last article gave a lot of important details regarding apprenticeships with Qantas. Coyrura is a very important publication for the Correspondence Section, but anyone can receive a year's subscription simply by sending $1.00 to the Editor, Roger Davis, 14 Howes St., Canberra City, 2601. Individual copies are also available from the same source.

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CONTEST CALENDAR

11th/12th Nov.: R.S.G.B. 7 Mc. DX Contest (c.w. section).
11th/12th Nov.: OK C.w DX Contest.
25th/26th Nov: "CQ" W.W DX Contest (c.w. section).
9th Dec. 1967/14th Jan., 1968: Ross Hull Memorial Trophy V.h.f. Contest.
3rd/4th Feb. 34th A.R.R.L. International DX Competition (phone, 1st week-end).
17th/18th Feb.: 34th A.R.R.L. International DX Competition (c.w., 1st week-end).
2nd/3rd Mar.: 34th A.R.R.L. International DX Competition (phone, 2nd week-end).
16th/17th Mar. 34th A.R.R.L. International DX Competition (c.w., 2nd week-end).

FEDERAL AND DIVISIONAL MONTHLY NEWS REPORTS

(SEND CORRESPONDENCE DIRECT TO DIVISIONAL REPORTER NAMED AT PARA. END)

FEDERAL QSL BUREAU

The new address for the WI QSL Bureau is Paul R. Hubbard, WA8CXY, 921 Market St., Gainesville, Ohio, 43701

The correct address for 9M2 cards is P.O. Box 777, Kuala Lumpur, Malaysia.

QSLs for the recent DX-pedition to Trinidade Island should be sent to PY1TX, P.O. Box 4, Resende R.J., Brazil. Nothing was heard from the DX-pedition on c.w. at this location

The second International Convention of Radio Amateurs is scheduled to open in Zaragoza, Spain, in May 1968. A competition open to all Amateurs will be held as a momento of the Convention.

To be eligible for an award it is necessary to establish communication with an Amateur in the province of Zaragoza and in addition to have contacted 30 other different I.A.R.U countries. Any band or mode may be used and the time period is 31st October to 31st December 1967, inclusive. The 31 QSLs accompanied by 10 I.R.C should be sent to Delegation U.R.E., Apartado 88, Zaragoza, Spain

Details of the OK DX Contest to be held from 00z to 24z on Sunday, Nov. 12, may be had from the Bureau. The contest is all bands 1.8 to 28 Mc. for c.w. only

Old DX-ers will be sorry to learn of the sudden passing on 29th September of Earl Lucas, W2JT

—Ray Jones, VK3RJ, Manager

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NEW SOUTH WALES

VICE-PRESIDENT RESIGNS FROM COUNCIL

Council has advised that the resignation of Bill Lewis 2YB has been received and accepted. Bill as Councillor was Vice-President but due to his recent illness was unable to carry on. Bill has recovered quite remarkably and was present at the last general meeting where he was looking quite well. After many years of Institute activities, many of them on Council and various committees and as a President and lastly a Vice-President, Bill has played an enviable part in the Institute and Amateur affairs, such that his assistance and guidance will be missed

In calling for a nomination for Council, President Keith Finney said that it would be difficult to find someone willing to work as hard as Bill had done, however Council would like to receive nominations for a Councillor to fill this vacancy on Council.

I would like to take this opportunity, if I may, to thank Bill on behalf of Council and members for the many years of untiring service to the Division, members and Amateur Radio, and to wish Bill a complete recovery so that he may be able to carry on the good work and enjoy many more hours on the key working DX and the like.

SEPTEMBER GENERAL MEETING

The September General Meeting was held at Wireless Institute Centre on the 22nd and a good attendance of members was present. The Chairman, President Keith Finney, opened the meeting at 8 p.m with the usual formality of the reading of the minutes of the last meeting. The chairman gave a brief report of Council activities to the meeting. The minute secretary, Warwick Johnstone, then read out the list of new members which were approved and are welcomed to the Institute.

President Finney reminded the meeting that the drive for more members must continue so that the Divisional services can be maintained. Speaking of Dural, Keith said that the new transmitters had arrived at the station and that the S.w.l. Group were in the process of tidying up the property and generally getting the buildings in order. The work on the communications room in the basement is complete to the stage where it is ready for the installation of the equipment, and the renovations and clean-up of the radio equipment store is all but complete. While on the subject of the store, there's quite a few bargains to be had if you care to visit and look around.

After concluding the report, Keith handed the meeting over to the lecturer, John Featherstone, who spoke on a very popular group of subjects under the title "The antenna as a coupling medium to the Ionosphere". John explained in a fairly detailed yet concise and easily understood way the part played by the ionosphere in making radio communications possible, and with the aid of five printed sheets, including a detailed reference list of authors, John proved to be a well appreciated lecturer so those present learnt a great deal on a little known subject. Going into the subject of receiving signals, John explained the various causes of fading and described how antennae were used to best effect to combat this difficulty and went on to describe a revolutionary design of a wide-band antenna consisting of some 80 vertically polarised discone type antennae which are coupled together via different lengths of co-ax to provide diversity reception from virtually all directions.

Although hardly suitable for an Amateur station John said he had an idea he would like anyone to try out and let him know the results, good or bad! Briefly, it is this: Set up two antennae as far apart as possible, both different types, differently polarised, and connect each to a receiver, and then connect the output of the receivers each to one headphone of a pair of stereo or split headphones so that the signal from each antenna/receiver can be heard simultaneously. In explanation, John said that the ears and head acted as a unique phase and amplitude combining network, a function which he felt could not be done electrically! John concluded by saying that if this set-up was done well, then if a signal was received 90% copy should be possible.

After answering several well placed and interesting questions, the lecture was completed and a vote of thanks moved by yours truly was appropriately carried. The meeting was then closed by the chairman.

The November meeting will feature a lecture on DX to be given by the well known, Sid Molen, VK2SG.

ANNUAL CONVENTION, AUSTRALIA DAY WEEK-END, 1968

The Convention is now drawing closer and intending visitors to the Dinner are reminded to place the necessary bookings with the Secretary. The Dinner will be held in the very beautiful Windsor Gardens restaurant at Chatswood. The tickets are limited to 150 and already half have been taken. The tickets are priced at $4.50 and include admission to the display of commercial Amateur equipment to be arranged prior to the Dinner. Cocktails will be available as well as the other amenities which are available so the ladies will be able to get together while the OMs decide on what to blow the family funds on!

Council have still not yet decided (at the time these notes were written) on the details of the Field Day. Council did say that the day will be held on the Sunday, as is usual, but that this time the field events will be different. Full details of the events should be available for publication in next month's "A.R."

V.H.F. AND T.V. GROUP CABARET

On 15th Sept. the Group Cabaret was held at the Ramsgate R.S.L. Club where eventually nearly 80 or so enjoyed a well presented supper and floor show indispersed by dancing. The Cabaret was planned to be held at the South Hurstville branch but at 4 o'clock on the day concerned the organiser, Norm 2ZXC, found that no booking had been made and in the following four hours he did a super human task and arranged for the Ramsgate Club to hold the function. Although the evening was slow starting up, the four-course supper was well taken care of and enjoyed by all.

REQUEST FOR ASSISTANCE—QANTAS

In a letter to Dave Jeans, 2BBJ, a Councillor of this Division, Mr. Gibson, the Controller of the Research and Information Bureau of Qantas Airways, says that they have a very comprehensive library on the history of aviation and the development of the aeroplane. It currently contains approximately 2,500 volumes.

Qantas have been trying to locate a copy of "Sea, Land and Air," Vol. 2, which commenced in April 1919. This journal was the official journal of the Wireless Institute of N.S.W. and the Australian Aero Club. Qantas have Volume 1 published in 1918, and are anxious to obtain a copy of Volume 2. Any information on this request should be forwarded to Dave at his QTH or to the Divisional Secretary.

LIBRARY SERVICE

The Library at Atcheson Street contains many and varied books and magazines and the service is now handled by the Secretary Books can be obtained for one month by forwarding your request with postage fee. At this time it may be better to use another mode of transmission and reception! Very shortly the room at Atcheson Street where the Library is housed and the office area is going to be repainted. 73, Stan 2ZRD.

CENTRAL COAST RADIO CLUB

For the September meeting, Central Coast Radio Club members and visitors enjoyed a trip on the Asian Highway from Bombay to London. This was the subject of the talk given by Phil, Levenspeil, VK2TX, following his recent return from overseas.

The 63-day bus trip covering some 13,000 miles, through 16 countries, probably provides the greatest variety of scenery and situations.

The talk was very well illustrated by colour slides, some of which were taken under extreme difficulties. 73, Bill 2TS.

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SILENT KEY

It is with deep regret that we record the passing of the following Amateurs:

VK3AJL—J. F. Long
VK7XL—George Groves

VICTORIA

WORKED ALL NATIONAL PARKS AWARD

In an endeavour to stimulate activity, the Victorian Division proposes to establish an award to be known as the Worked All National Parks Award. Final details have still to be decided, but it is proposed that the award will be completely "open", that is any band, any mode, any time. Awards will be made not only to those who work all National Parks, but also to those who work FROM all National Parks. As there are 20 parks classified as "National" in Victoria, it is not anticipated that the award will be easily won. We expect to have the final details ready for publication next month, in order that advantage may be taken of the Xmas holiday period to get the award away to a flying start.

The award will be available to all Australian Amateurs be they W.I.A. members or not. Awards will also be available to S.w.l's who hear all National Parks.

This award has been discussed with the Secretary of the National Parks Authority, and we have his co-operation and blessing.

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QUEENSLAND

IPSWICH AND DISTRICT RADIO CLUB

Once again the club has had a very eventful month, both socially and radio-wise, so here are a few jottings on how we spent our time.

The club was most fortunate to have had a visit from Don 4GP and Don gave us a very interesting lecture accompanied by photographs on Relaying Television Programmes via Satellite. Don was involved in both "Our World" and "Expo '67" programme, so he was able to give first hand knowledge, and on behalf of all club members, our thanks to Don.

Seems that since our membership is on the increase, the size of the club house is also increasing, since we had to add an extra room underneath to accommodate our junk. We now have found a corner of the club rooms lost some time ago when the A14 was deposited there.

One of our newer members, Cyril Renton, arrived at the last meeting very pleased with himself. He had received notification from the P.M.G. that he had passed the A.O.C.P. exam.

Norm 4KO and Ron 4RG played hosts to members of the Ipswich Boys' Grammar School Radio Club. The boys were able to talk to numerous DX stations as well as have a chat to one another via Ham Radio

Club member Tom has recently returned from a spot of leave at Bowral in VK2. Seems

Tom has been trying to get his 6 mx receiver mounted in his Mini, but can't find room on the dash, because of a most elaborate instrument set-up. Looks like it will have to hang from the roof, Tom.

Much discussion about 2 mx club project, but nothing concrete as yet. May be next month we will have decided our net frequency and type of gear we will all build.

That's all for this month. 73, Warren 4GT.

BUNDABERG AMATEUR RADIO CLUB

The month of September has been a very busy one for the Club. Most of the Pye Mk. 2 Taxiphones have been converted and are in going order. We can get a contact on 6 mx most times now 53.032 Mc is the net frequency.

Prior to the State-wide V.h.f. Field Day on 17th of the month, we had scouting parties out in all directions trying to find some high mountains to work all the long haul ground wave on 6 mx. Our club members, the younger ones, had a marvellous time on two or three week-ends climbing around some of the Dawes Ranges, about 80 miles north of the city, picking the best spot. Eventually the site was chosen and 5/8 signals were exchanged with the older members who elected to stay at home, including yours truly.

On the day of the 17th, the big day, two parties went out, one north to the Dawes Ranges, and one south to Mt. Goonenaman, 50 miles away. What a feast these chaps had, with 5/9 exchange of signals with other Amateurs in Rockhampton, 200 miles away to the north, and Brisbane, 200 miles away to the south. There is more in the v.h.f. business than meets the eye.

I presume a full account will be presented in the v.h.f. news, so I will press on.

On Saturday, 30th, we held a very successful W.I.C.E.N. Exercise with both h.f. and v.h.f. stations participating. For a first run, there were surprisingly few holdups and the exercise was finished with nothing worse than many flat batteries.

The emergency power plant is progressing slowly towards being finished. We have had to put the launching date back several times but will definitely have it finished before the next cyclone season.

On the h.f. side of things, the boys are, of course, having a ball with the bands as lively as they are with many new countries worked each week. It is nice to have not been on the air long enough to have worked them all.

That winds it up for now. 73, Rusty 4JM.

TOWNSVILLE AND DISTRICT

Just don't know what is happening these days, apparently my spies have defected as there appears no news of what is happening in this part of the State. Who knows, maybe, I will have to be like PanSy. See the Editor and get a few more zeros added to my salary.

No one knows better than I, how the DX conditions are not favouring the north. Why the other afternoon heard 3MO giving R 20 db. over S to a G, when he was hardly audible at my shack. This being quite common at the present time. How I long for the old days when I was able to work plenty of them. The wheel must revolve ere long.

Do I listen at the wrong times as I seem to notice quite a lull amongst the locals on the various bands. My latest exploit was the working of the DX-pedition to Easter Island. So will have to watch "A.R." to find out his QSL manager.

This winter season saw very little of the Amateur fraternity passing through, chasing the Sunshine. Must be all those droughts causing lean pockets. Speaking of droughts, sincerely hope Black Friday does not return to VK3 land. Especially after VK7 this year.

Padding will have to cease! 73, Bob 4RW.

SOUTH AUSTRALIA

The monthly general meeting of the VK5 Division was held for September in the club rooms to a slightly below average attendance of members and visitors, the reason for which still remains obscure. However, the only reason I mention it is because these monthly notes always mention the fact that standing room only is usually the case with such meetings, and if I occasionally failed to mention the sometimes below average attendance, one of the Wise Men from the East would smartly pick me up on the matter, with the consequent loss of faith on my honest reporting—Ahem.

No Federal business was in hand, not much Divisional business was discussed, which meant that our worthy President, Murray 5ZQ, declared the business side of the meeting closed and without much ado, introduced the guest speaker, Mr. F. Oxer, of the Electricity Trust of South Australia, who took as his subject, "Electrical Safety Standards".

Mr Oxer divided his lecture into three main parts—the causes of electrical shocks and their medical effects; the prevention of shock, with several practical demonstrations of the efficiency of earthing; and the causes and effects of electrical fires. He soon established the fact that he knew his subject, and throughout the entire lecture and the questions that followed, the audience was entertained and instructed on the sometimes little known safety factors and safety standards required by E.T.S.A. in this State, and the nature of the questions and the rapt attention paid to the lecturer by all present, should have amply repaid Mr. Oxer for the undoubted thought and time that he had put into his subject.

The vote of thanks to the lecturer was proposed by Warwick 5PS and the applause that followed was sufficient indication of the success of the lecture and the lecturer.

The meeting closed at 10.30 p.m. and as I heard no complaints from any direction, I can only conclude that all of the demonstration equipment was returned safely after travelling up and down the rows of seats, and thus can close this report of the meeting by stating that our Divisional reputation for honesty remains unsullied, despite several covetous glances at the circuit breakers by one or two members, who must remain unknown for safety reasons—my safety!

Just before the meeting, if members had kept their peepers open, they would have had the unusual chance of seeing the VK5 Disposals Committee in action in the far corner of the club room. A fine upstanding body of men are they, ever ready to do battle for the benefit of members, and ever ready to speak coarsely to the brave member who might have thoughts of thwarting their plans, and their outstanding run of success disposal-wise over the past months must be as music to their ears. Our congratulations, gentlemen, you will all be rewarded some day, don't ask me when exactly, I am still trying to find out.

Apparently arising from the above impromptu meeting, the chairman, Gilbert 5GX, spoke to the meeting on the availability of a supply of resistors which had just become available from an undisclosed source. Nice work.

Rex 5DO, although still in the testing period of his new quad for 10-15-20 mx, is more than pleased with the results. He tells me that he had a contact with Roy 5AC, something he has waited about 40 years or so to accomplish, because all that time ago, when he was only an eight or ten year old, he saw the gear of Roy's, and from this was given the necessary inspiration to have a go at Amateur Radio. How is that Roy? What does it feel like to be an inspiration?

Rob 5WA recently arrived back from a visit to his old stamping ground of VK6, was quite enthusiastic about his trip. He was hoping to meet one or two of the locals that he has worked at various times, but went down with a virus for about a week, and this did not help the visiting schedule. Incidentally, he left VK6 for VK5 back in 1916, so we won't hold it against him, after all he could have gone on to VK3!

Talking of VK3, and why I persist in this deplorable habit beats me, I hear that Les 5NJ has been jaunting in that general direction for the past fortnight. His 90w. mobile has been heard from the main street in Ballarat, from Cooma, Eden, Canberra and many points east. What it is to be a member of the idle rich and live a life of travel and luxury. What is the secret of success, Les? What about a lecture on the subject to the general membership? You beaut!

Harry 5MY heard contacting Don Miller, VQ9LCR-VQ9CBR, on 20, 40 and 80 mx, to say nothing of Johnny 5KO doing the same and on 1.8 Mc. as well.

There used to be a saying in VK5, copied no doubt, that if one stood on the Beehive Corner in King William Street for long enough that one would be a certainty to see everybody that one knew in VK5. This is somewhat true for 7 Mc. these days, as I always seem to get my answers to my questions by listening long enough on this band. What I wanted to know this time was just how that ex-VK5 character, Rupert 7RM, was making out these days, and sure enough I listened in to the mail of a couple of VK3 jokers the other early evening, just in time to hear one of them say that he had recently paid a visit to "Roop," and he was still as active as ever and thoroughly sold on his s.s.b. equipment ("The Thing" to you). In view of the fact that he must be that close to 60 years young that it does not matter, I think he should be proud of himself. Good to hear about you "Roop," and that goes for the gang over there.

Don 5DX could almost claim the title of being the VK5 beacon station on 14 Mc., as any time that I have been listening on that band he has been sure to be there with his characteristic c.w. fist. This bloke is one of the "younger oldtimers," in fact he could get away with that title, in view of his years of activity in the radio game, both amateur and professional.

The XYL went out to the post the other afternoon and returned with the doubtful statement that "here is a letter from your friend in Broken Hill." Now only an XYL, with a charming and innocent viewpoint, could make such a statement about Dud 2DQ, and naturally I was prepared for the worst, but there was no cause for alarm as all the outsize in envelopes contained was an advance publicity blurb for the annual Hamilton Sidebanders' "Get Together" which is tentatively scheduled for the Australia Holiday Day in 1968. To add insult to injury, there was also an application form attached for booking accommodation, etc., and provision to let them know if I would be attending. I intend to treat the whole thing with the ignore that it rightly deserves, in the somewhat vain hope that "my friend from Broken Hill" will at last get the message, but knowing his reputation for persistency I fear it will be a waste of time. Incidentally, Dud, I never get those messages via "The Thing" that you keep on sending down to me via those misguided users of your favourite mode of communication. Well, not all of them anyway!!

Came upon an old copy of "CQ" the other day during one of my somewhat feeble attempts to tidy up the shack and was intrigued to note the Amateur frequency allocations for 1928. You might be interested, dear reader, to note that it went like this: 1,500 to 2,000 Kc., 3,500 to 4,000 Kc., 7,000 to 8,000 Kc., 14,000 to 16,000 Kc., 56,000 to 64,000 Kc. What a Utopia?

DX to me has of course always meant distance, and on my day there was nobody keener on such a facet of Amateur Radio, and for that matter I am still as keen, but to a lesser degree. In view of this opening statement I was somewhat taken aback to read in the latest issue of "CQ" a letter to the Editor which I respectfully will repeat in the hope that the moral will strike you as it certainly struck me. The story is about an Amateur who lived in Eastport, Maine, U.S.A., to whom DX was his supreme delight, and one day his first CQ brought forth a call from Penzance in Cornwall, to be followed by Viminano in Spain. Then in succession he worked Scotland, Iceland, Greenland, The Azores Islands and Ireland, to be followed after lunch by Panama, Costa Rica, Honduras, Guatemala, Mexico, El Salvador, The Dominican Republic, Trinidad, Cuba, French Guiana, Venezuela, Colombia and an expeditionary party in Brazil. In the late afternoon he worked VE4, 5, 6, 7 and also a VE8, and about ready to call it a day he worked a KL7 in Hyder, Alaska. About ready to give it away for the day, a W6 called him and he had a f.b. ragchew with the local stateside station. He went to bed that night and dreamt about all the wonderful DX he had worked that day, but what he did not dream about was that the W6 was the best DX he had worked all day! The letter ended by saying that nobody must be alarmed or provoked, all of the distances have been carefully checked using the correct latitudes and longitudes, and a real sophisticated computer programme. Pleasant dreams, 73, and DX!! My sincere thanks to John W6OA whose letter, quoted above, has a moral for all to read and absorb.

Some weeks back, Gary 5ZK began to dismantle his tower and prepare to remove the said tower to another QTH. Either he has got the stitch or the tower is too high, because there is still a lot of tower visible from the Marion Road. Possibly my undercover agent has been mis-informed.

Talking of towers, I recently commented in these notes that Johnny 5MX had erected a quad up in the sky at Woodville. Now, lo and behold, a yagi decorates the skyline, which leads me to wonder if we have discovered a new "umbrella man" in our midst. Shades of the late Jim 5JK.

The Sunday morning W.I.A. broadcasts are certainly getting around. It is now learned with some authority that 5ZKR is relaying it on 144 Mc. for the benefit of the Mount Gambier area. Reports are also to hand of a possible re-broadcast of the session in the Darwin area on 52 Mc. for the local consumption, this being taken from the 14 Mc. transmission of 5NM. The signal must be getting into the Darwin area to permit this.

We definitely have a successful gardener in our midst. Athol 5LQ still talking about his tomatoes and such like. There was some slight reference, to which I turned my famous deaf ear, to the fact that he had some raspberries for any nosey listener-in to the conversation, but I don't think he was dinkum. Who would grow a raspberry tree near an aerial?

Max 5GF heard reporting that his mobile was off the air due to a car accident. He has another car but apparently not another mobile rig, one of the disadvantages of having two motor cars. Ho hum, life is full of such disadvantages—so I have heard!!

One of our "elderly brethren" was recently advised that he had been logged overseas as being out of the band on an occasion. Not very amused, and decidedly mystified, he produced his 7001 crystal for checking and was informed from two reliable sources that it was spot-on. To make sure for the future, and as a further precaution, he now has a base frequency of 2502, again crystal controlled. Nothing like being careful, is there?

My comment about the Morse classes at the School of Modern Languages at North Adelaide moved Phil 5NN, he of the poultry section in VK5, to suggest that the so called "pump handle" method of communication is a dead language, not a modern language. How cruel can they get? Fancy telling Johnny 5KO, Harry 5MY, George 5RX, Uncle Tom 5TY—to name a few—such a story. Why they would cut him to pieces and have him for Sunday's dinner!

In an endeavour to do something for the Associate members' welfare, Council recently agreed to stage a special meeting on a Friday night at a suburban venue. Reports to hand seem to indicate that it was not altogether a success, due to the lack of attendance of the Associate members. Despite this, it is intended to have another go soon.

Had a quick visit from Claude 5CH, together with his XYL, the other early evening. They did not stop long, as they were on their way to listen to the big Salvation Band that was visiting VK5 for a couple of days or so. Did not get much news of the S.E. boys from Claude, due to the shortness of his visit, but he has promised to call in again some time in November and make the visit longer, so probably I will catch up on the doings of Mount Gambier and surrounding areas then.

Heard somebody querying at the meeting as to why on the R.D. scoring table a VK5 gets five points for a VK6 contact, but a VK6 contacting a VK5 only gets three points. Did not buy into that one at the time as no doubt there is a good reason for it and I am an old shrewdie on such discussions. I never comment until I am sure.

Noticed in the article on Joe 5JT in the Sept. issue of "A.R." that somewhere along the line he lost four years somewhere or other. "81 years old last May, which makes him born in 1886, he enlisted in the R.A.A.F. in 1940 at the age of 49 years. Anyway, what is the matter of four years between friends? Joe is good for another forty years or so, judging by his 14 Mc. c.w. I wish I had his energy and ability.

Have heard nothing for some time from Jack 5LR who at my last mention in these notes had just shifted his QTH down to Victor Harbour and was in the throes of building a new home and all that goes with it. Hope you and Flo are in the pink Jack, and with the finer weather coming along now, will probably harness Dobbin up again to the milky and visit Victor Harbour ere long. See you on the screwpile jetty, Jack.

Once every year I bump into the old, old, old question, "Why do I write a paragraph about an Amateur who is not a member of the W.I.A.?" This year it was asked by a member who is a pretty solid joker, quite tolerant, and one who has made a name for himself in our grand old hobby, mostly on c.w. Once again I explained that providing anybody had a call sign and had some news value, I did not care whether he was a member of the W.I.A. or not, to me he was an Amateur, and that was all that mattered. If he did not have the gumption to see just what value being a member of the W.I.A. could bring him, then that was his business, although how anybody with the brains to pass the exam. could fail to see this always amazes me. Incidentally, it is surprising the number of non-members who have joined up after seeing their name in the magazine, apparently they get the message quicker that way.

Well, wrap it up again for this month, and all being well will see you next month. The reason I write this is that I am off next week to the wilds of VK3—Ballarat to be exact—and once I enter VK3, anything could happen, that Pincott 3AFJ has his spies everywhere! Will I make it, will I return, will they break my spirit? Tune in next month for the gory details of my encounter with the unknown in VK3. What's that? You won't, garchal!

73 de 5PS—PunSy to you.

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WESTERN AUSTRALIA

Hi customers! As mentioned last month, the Institute Picnic was held at Yanchep and was attended by somewhere in the vicinity of 100 people. The use of the north oval was allowed free of charge by the Yanchep Park Board, for which we are extremely grateful. It was stressed right from the start that this was not to be a radio day, but a family day, consequently XYLs, YLs and harmonics appeared in relatively good moods.

Talking about appearing in things reminds me of a fairly recent arrival to our sunny shores. No doubt some shocker had been regaling him with dreadful tales about folk being lost in the Australian bush, and the effects of snakebite, etc. Not wishing to fade into the obscurity of one lost in the dense scrub of Yanchep, our friend "KK" appeared in a very snappy ensemble, so vividly coloured that it almost defied description. Let it suffice to say that his shirt was the colour of a fiery sunset, while shorts and matching cap were of floral design. I am almost certain that his preparations included ample provision against snakebite, artfully concealed within his waggon. Nice to see you "KK".

Considerable interest was shown in the chariot of one Doug 6EP, who with XYL and family was holidaying in Perth at the time, and thus was able to represent Kalgoorlie. Pat 6PH and family journeyed up from Narrogin to make sure that this thriving township was not struck from the roll. In fact the Haywood family enjoyed quite a deal of success in the sporting section of the outing. Pat won the "kicking the football" contest, while daughter Jan really showed up the rest of the field by hurling a soft-ball far beyond her nearest rival.

Perhaps the highlight among the many sporting events was the "tug-o-war" in which a team of "Limited" licensees pitted their "skill" against the "Full" calls. Not satisfied with the results of their first attempt, the Z boys foolishly challenged for a second try, but weight, and superior staying power were agin them.

Coinciding nicely with the picnic day was the birthday of our President, Roy 6RY, who repaid our rendition of "Happy Birthday" by taking photos of the assembled group. Graham 6ZEZ was thoughtful enough to provide "music to munch to" per medium of the p.a. system, and I feel that a good time was had by all.

It is pleasing to see the relatively large attendances at our meetings of late. Among the visitors at the September meeting were Pete G3JFS, Jim G3HJF, Bernie 6KJ and son Kim. The two G-boys are to stay in VK6 for the next couple of years and both were eager to get their VK6 calls and get on the air.

At the time of writing, Vic 6VK has departed these sunny shores and taken up temporary residence amid the icy wastes of VK3, becoming assimilated in preparation for a spell in Antarctica. I wonder why Melbourne is chosen for all these hijinks, anyone would think it was cold over there. Strike, they don't get as much rain there as we do in Perth! Clambering back to safer ground, I might mention that Vic has left the r.t.t.y. rig at home but has included his sideband gear in the old kit bag and will be looking for contacts while stationed down in the cold, cold snow. Good luck Vic.

Nearly every station I have worked lately drives home the point that 10 metres is good. Blowed if I know, perhaps I don't use the right soap or something, but I can't hear a thing! It's getting to be like fishermen and fishing—"you should have been here yesterday . . ."

Rumour has it that some of the locals have been doing a spot of early rising in the hope of working ZS stations on 80 metres. While on the subject of ZS, a couple of v.h.f. types, ZS2PX and ZS4SA, will be swinging their antennae in the direction of VK6 using both s.s.b. and a.m. on 50 and 144 Mc. Watch for them.

Anyone fortunate enough to be visiting overseas countries (and I don't mean Rottnest Island thank you) should contact the Institute

for letters of introduction and general information on who's who and what's what before shooting through.

Following this line of thought, it may be of interest to note that W4CHA will be visiting Christmas Island during February and if his previous visit to Norfolk Island is any guide, will be very much in demand by the DX merchants.

Jack 8RT has just had a new 12 ft. mast erected for him (it comes complete with a new three storey shack attached) and is looking forward to hoisting a few wires just as soon as the builders evacuate.

There is a move afoot to "revive" the Zone 29 Award just as soon as the rules and regulations can be sorted out, so watch this space for further details.

News to hand just as I was about to close indicates that JAs were heard last eve on 6 metres and also some commercial type t.v. This could be a pointer to the coming DX season. Happy Ham-ing, Ross 6DA.

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TASMANIA

As I was exiled by my place of employment into the wilds of the State last month I am unable to give an outline of the meeting that occurred, but in place of that I feel the time is long overdue to give a commendation to the gentlemen of our disposals committee. The committee consists of a small and able group of volunteers (most of whom also hold other positions in the Division) who donate a remarkable amount of time and effort to acquiring and supplying to members a large array of parts and equipment, and managing things like circuit board sales. Full marks to this very able group for a job well done.

It was announced recently that W.I.C.E.N. (in Tasmania at least) is now recognised as an emergency communications network. We did operate at the beginning of this year during the fires, but now that we have been officially recognised and our system is in the process of being revised, we should be able to meet any situation presented in the future.

During the year we have had one resignation from Council (due to a move from Hobart) and rumour has it that several other members will not seek re-election next year. Because of this, several positions will fall vacant, so if you wish to see the Division continue as at present, give serious thought to joining Council and helping to ensure the well-being of all.

On October 1st, daylight saving was introduced to Tasmania and the clocksetting is now referred to as Tasmanian Summer Time. The trend in Amateur log-keeping lately has been towards the use of G.M.T., and this change in systems may encourage other operators to follow this trend.

The aeronautical mobile trip by Launceston Amateurs did occur, but due to weather conditions it was two weeks late. Although VK3 was not worked as they hoped, the group received good reports from the north and north-west of the state (and no one was air sick).

It is with regret we announce that George Groves, VK7XL, died suddenly on Saturday, 7th October, while playing golf. George was well known as Secretary of the North-West Zone for many years. Deep sympathy is extended to his wife and family.

Very little personal gossip this month, and what there is, is concerned only with s.s.b. (a sign of progress?). There is Winston 7WII, whose newly acquired transceiver is one of the finest pieces of workmanship I've seen for a long time (and its results prove its worth). My spies tell me that Brian 7TX is also planning a high power s.s.b. rig. Two more are therefore joining the clan. 73, 7ZLP.

HAMADS

Minimum 50c for thirty words. Extra words, 2c each.

Advertisements under this heading will be accepted only from Amateurs and S.w.l's. The Publishers reserve the right to reject any advertising which, in their opinion, is of a commercial nature. Copy must be received at P.O. Box 36, East Melbourne, Vic., 3002, by 5th of the month and remittance must accompany the advertisement.

FROM THE ESTATE of late John Duncan, VK3VZ, late Technical Editor of "A.R.": TH4 Thunderbird Beam on 32 ft. telescopic 3-section tubular self supporting tower, complete with turning motor, transformer, and selsyn, $120. Console consisting of Galaxy V., power supply, remote v.f.o., vox, 50 and 25 kc. calibrator, 813 g.g. linear with power supply; control panel with beam indicator, reflected power meter, all relays and cables, 33 in. high by 22 in. wide by 17 in. deep, with cantilever desk attached 22 x 17 in., cabinet on Shepherd castors, $750. AMR200 (Super Pro copy) Rx with power supply, $70. All wave Rx, home brew, 80 through 2 mx, 7 bands, plus 3 to 6 Mc. and 13.5 to 16.9 Mc. 6 bands, crystal locked, includes two Command Rx's, one being BC453 Q5 with p.s., no cabinet, $40. 522 Set, 2 mx, $8. LM14 Frequency Meter with p.s., $60. Eddystone transistorised Absorption Wave Meter, $5. TU7B Tuning Box, $4. UM2 Woden Modulation transformer, 120w. audio, Henderson output transformer, 5000 c.t. to 2.3-500, $10. The following home brew instruments: 5 inch CRO, pwr. sup., and probes, $30. Resistance-Capacity Bridge, tone input, $8. Sig. Gen., r.f., f.m., a.m., square and sine wave, $14. VTVM, $15. GDO and pwr. sup., $10. Antenna Scope—phase-c.w.-g.d.o., Absorption Wave Meter, $5. Multi Vibrator, 500 Kc., 100 Kc., and 10 Kc., $5. Valves, meters, transformers, etc., etc. Prior enquiries to Russell Bradshaw, VK3SX (phone 82-2152). Gear only available at 6 Columbia St., North Balwyn, from 10 a.m. on 4th and 11th Nov.

FOR SALE: Drake 2B Amateur band Receiver, complete with Q Multiplier speaker, 100 Kc. crystal calibrator, extra crystal for 28 Mc. band and handbook, perfect order, $300. Also, Amateur band Rx with Geloso Front-end, double conversion, containing parts costing $160 including Collins mechanical filter, working but requires some attention, $80. UM3 Woden Modulation Transformer, new condition, $16. LSG Type 11 Signal Generator, $10. VK3MJ, phone 45-6252 (Melbourne).

FOR SALE: Galaxy V. Amateur Station. VOX and 100 Kc. Calibrator installed, 12 volt Galaxy supply and home-built 240VAC supply, Heath SB610 monitor, Gentec 500 watt 50 ohm dummy load, Galaxy remote VFO unit, mic, key, rotator, Quad antenna, etc., as a complete station. Sutherland, P.O. Box 405, Port Moresby, Papua.

FOR SALE: R-23/ARC5 Command Rx, 190-550 Kc., brand new, $30. BC453B, excellent condition, $30. Offers for d.s.b. tx described in Electronics Nov. '65, or will sell any part thereof. VK5FR, 7 Short Ave., Glenelg East, S.A., 5045.

FOR SALE: Transistor Power Supply A.W.A. 12 or 24 volt, as used with MR20B Carphone, $26.00. Tubes, 6/40, $10. Wanted, AR7 dial and gear box. Also BC348 Receiver. VK3IZ, phone 437-1911.

FOR SALE: Viceroy Mark 2 Transmitter with power supply, had very little use, excellent condition, $400. E. J. Porritt, VK2AL, 18 Currawang St., Blakehurst, N.S.W. Phone 54-1556 (Sydney).

GELOSO G4/214, double super Rx, $150. Heath DX40U with three crystals, $80. Geloso 4/102 VFO with valves, $16. Sell as lot, $200. Foster, VK5EW, 10 Haidane St., Elizabeth Downs, S.A.

HALLICRAFTERS HT32B Filter Xmittar, s.s.b., a.m., c.w., complete with dynamic mic. and desk stand, 600w. 240/110 transformer, spare tubes and handbook, $400. Hallicrafters SX101 Amateur Rcvr., s.s.b. 160 through 10, complete with spare tubes, 240/110 transformer and handbook, $200. Hallicrafters SX62A Communications Rcvr., 550 Kc. to 108 Mc., a.m., f.m., c.w., var. selectivity, xtal cal., with handbook, 240v. a.c. op., $300. TA33 Triband Beam, complete with prop. pitch motor, 240/24 trans., reversing relay and pair unused Selsyn motors, $135. Pair 813s with sockets and 10v. 10 amp. fil. trans., $20. This equipment is in excellent condition and is for genuine sale. VK5XB, W. M. Crawford, Box 142, Kingston, S.E., South Aus. phone 205.

REMOTE VFO for Galaxy Transceiver, $20. Ferguson Tape Recorder, Model 3200, twin track, in new condition, $50. Tech VTVM, complete with r.f. probe, used twice, $45. Aerial Coupler, $2. Stromberg Carlson Gramo Motor with crystal pick-up, $5. Amplifier or above, push pull 6V6s, $20. Broadcast Radio to go with above, $5. Set Letter Punches, ½ inch, complete alphabet, $1. 8 mm. Photo Outfit, $160 lot, or separately, Canon Reflex Camera, 8-2 F1.4 Zoom Lens, in leather case with pistol grip and 25 ft. Kodachrome Film, $100; Noris Projector, Zoom Lens, $50; Academy Editor, new, $15; LPL 8 and 16 mm. Splicer, new, $5. Apply Alf Chandler, VK3LC, 1536 High St., Glen Iris, Vic., 3146. Phone 50-2558.

SELL: AT5 Tx, 5 bands. 522 144 mag. Tx, both with tubes. What offers. S.a.e. for reply. VK7TE, 44 Mayne St., Launceston, Tas., 7250.

SELL: Bendix Compass Rx, re-built, with separate 20 and 15 mx crystal converters, excellent a.m. and s.s.b., $50 lot. 2 x 3B/300 (4-125A) tubes, sockets, $15. Two identical AVA filters 5286 Kc., carrier crystals, $30. 80-10 mx 100w. a.m. Tx; Geloso 4/104 VFO, OQE0640 p.s., Geloso pi output, t.v.i. proof, $30. Type A Mk. III., 80-40 c.w. Tx-Rx with 3510 crystal, $20. Class C Wavemeter, $10. AMR300, works, needs attention, registered Y.R.C. may collect. D. Fisher, VK2AFD, 25 Kapooka Ave., Dapto, N.S.W. Phone Wollongong 61-2144.

SELL: Hammarlund HQ145 Receiver, general coverage with bandspread, 550 Kc. to 30 Mc., double conversion, product detector, xtal cal., etc., 240v. operation, in mint condition, $300. G. A. van der Harst, VK5XV, 21 Dudley Cres., Marino, S.A., 5049. Phone 96-3138.

SELL: Heathkit Apache/SB10 combination, antenna relay, ready to go, $275. H. Trutmann, 7 Nerita Gardens, Corio, Vic., 3214. Phone 78111.

SELL: 40 ft. Wooden Mast, 20 ft. Gin Pole Ladder and 7 pulley block and tackle. Mast hinges at base. One man can erect pole. Ideal 2 el. beam. $29.50. VK3XU, Phone 772-2880.

SEND two 5c stamps for catalogue of bargain priced new and used radio equipment and instruments. Eastern and Mountain District Radio Club, Disposals Committee, P.O. Box 33, Olinda, Vic., 3788.

WANTED: Collins F455-40 Mechanical Filter, 4 Kc. Sell: General coverage Receiver, BC348 type, handbook, essential mods. only, appearance fair, performance good. Details, VK1AU, Col Harvey, 16 Leane St., Hughes, A.C.T.

WANTED TO BUY: Valves: A442, A415, B406, A306, 201A, UX199, with reasonable emission. Philips' 3003 Eliminator (complete). Pre-1930 receivers—such as PCJ4 and one with commercial honeycomb coils. (Also early radio mags.) Not for re-sale—reasonable prices paid. I. Drysdale, P.O. Box 80, Sandringham, Vic., 3191.

WANTED: Back numbers of A.R.R.L. Handbooks, "73," "QST" and "A.R.". I pay freight, details and price to J. Wayland, 97 Cambridge St., Camp Hill, Qld., 4152.

WANTED: Control Box for AD704 V.h.f. Nav. and Comm. Receiver. 108.0-135.9 Mc., also Command Receiver in any condition. David Hughes, L3242, phone 29-3706 (Melbourne).

WANTED: Group Leaders with knowledge of Radio to supervise small Y.R.S. correspondence groups of keen young people. For further details write R. Davis, 14 Hovea St., O'Connor, Canberra, A.C.T.

WANTED TO BUY: Pre-1927 Radio Sets and parts, especially bright emitter and early tx valves, neutrodyne rx's. Also magazines (not Listener In) and A.R.R.L. Handbooks, pre-1934. F. K. McTaggart, VK3NW, 37 Ryeburne Ave., Hawthorn East, Vic., Phone 82-1141.

WANTED: T.v.i. proof, Table-top a.m. Rig, xtal or v.f.o. control, capable 150 watts minimum, both 80 and 40 metres. Offers with full details to the Secretary, W.I.A., P.O. Box 36, East Melbourne, Vic., 3002.

WANTED: Urgently to get back on the air, trimmer capacitor assembly for Geloso v.f.o. type 4/102/V star. This consists of set of three air trimmers. Ted Owen, VK5UK, 26 Symonds Cres., Modbury, S.A., 5092. Phone 64-3877 (Adelaide).

WANTED: Vox Unit for Galaxy Transceiver. Russell Bradshaw, VK3SX. Phone 82-2152 (Melbourne).

WANTED: 4CX250B air system socket. Good price. VK3ZVV, Phone 277-8295 (Melbourne).

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  DC volts: 1.5, 5, 15, 50, 150, 500, 1500. AC volts: 1.5, 5, 15, 50, 150, 500, 1500v. r.m.s.; 1.4, 4, 14, 40, 140, 400, 1400, 4000v. p-p. Resistance: R × 10, 100, 1K, 10K, 100K, 1M, 10M. Decibel: —10 db. to +65 db. **£50.00.**

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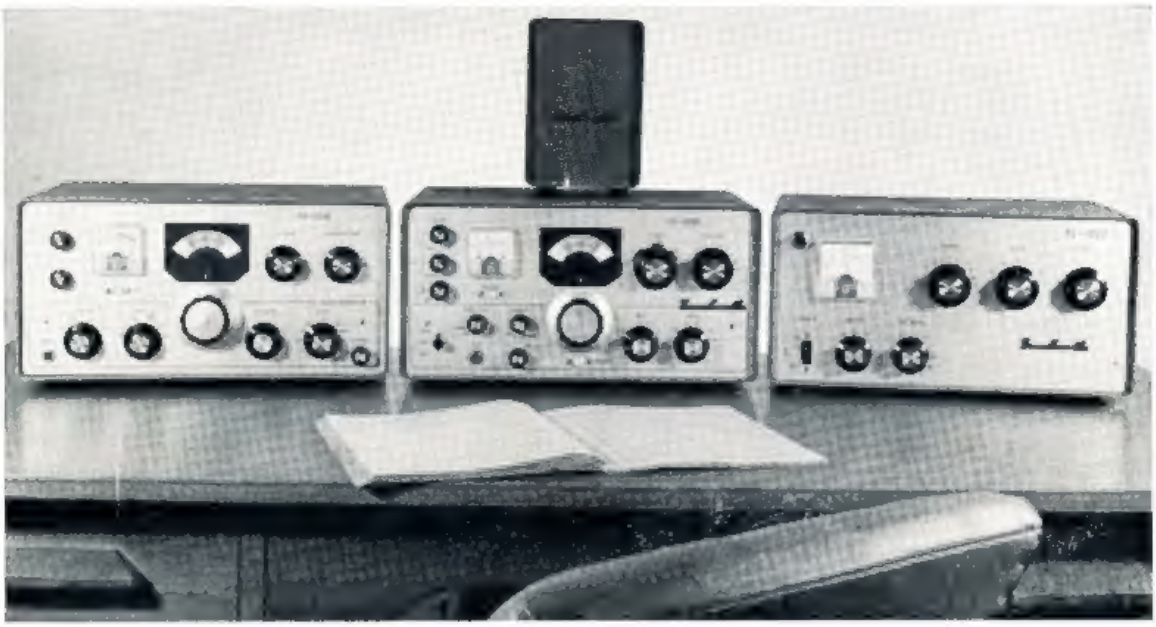

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S.S.B. with V.O.X. & P.T.T., C.W. break-in, and A.M. Transceive or separate operation.

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SPECIFICATIONS:

FR-100B: RECEIVER, DE-LUXE MODEL. S.S.B.-A.M.-C.W. dual conversion with crystal locked front end. Now includes 100 Kc. calibrator and three ranges on 10 mx. Sensitivity, 0.25 micro-volts for 10 db. S plus N/N ratio. Two mechanical filters, 2.1 Kc. for S.S.B. and 4 Kc. for A.M. Crystal filter for C.W. High reduction precision gear-driven dial with read out of 1 Kc. A.N.L., "S" meter, A.G.C., offset tuning, crystal controlled B.F.O. with selectable sidebands, built-in monitor, ring demodulator. Freq. ranges: 3.5-4.1 Mc., 6.9-7.5 Mc., 13.9-14.5 Mc., 20.9-21.5 Mc., 27.9-28.5 Mc., 28.5-29.5 Mc. Additional crystals available for WWV and three other a.w. ranges between 7.5 and 30 Mc. Adaptor kit available for F.M. **$399.**

FL200B: TRANSMITTER, S.S.B.-A.M.-C.W., two 6JS6As (similar 6HF5) tubes in p.a., 240w. p.e.p. input. Includes in-built antenna relay, V.O.X., A.L.C., U.S.B.-L.S.B. selection, extremely stable V.F.O., Kokusai M.F. Carrier and sideband suppression better than —50 db. Accessory socket provides connections for receiver muting and linear control. Frequency ranges, 3.5-4.1 Mc., 6.9-7.5 Mc., 13.9-14.5 Mc., 20.9-21.5 Mc., 27.9-28.5 Mc., 28.5-29.1 Mc. All plugs, inst. manual and p.b. microphone supplied. Nothing else to buy. On C.W., break-in operation is possible, TRX note, clean, chirpless keying, V.F.O. runs continuously. **$478.**

FL-2000: LINEAR AMP., four 6KD6s in g.g., 80-10 mx. Adds 2 to 3 "S" points to your DX reports. Will match any S.S.B. exciter capable of output power of 30 to 100 watts p.e.p. Power switch controls built-in relay for barefoot or amplifier operation withohut any cable changes. Standby switch for instant change-over A real signal booster for any Amateur exciter or transceiver available in VK. Simple to connect, easy to tune. Fully metered for plate current, output, and SWR indicator built-in. Fan cooled. **$278.**

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